THE BIRTH OF INDIAN CIVILIZATION

India and Pakistan before 500 B.C.

BRIDGET AND RAYMOND
ALLCHIN

PENGUIN BOOKS

Penguin Books Ltd, Harmondsworth, Middlesex, England
Penguin Books Inc., 7110 Ambassador Road, Baltimore, Maryland 21207, U.S.A.
Penguin Books Australia Ltd, Ringwood, Victoria, Australia

First published 1968

Made and printed in Great Britain
by Richard Clay (The Chaucer Press) Ltd,
Bungay, Suffolk
Set in Monotype Imprint

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PREFACE

THIS book is a joint production and the authors claim joint responsibility for its contents throughout, both for anything that may be regarded as an original contribution and for any mistakes it may contain. The book seeks to present a digest of the results of a great body of research, much of it barely completed, as far as possible in terms of the data themselves as the authors see them. Within these confines we have necessarily had to exclude much discussion of the views of other scholars where they differ from our own, or where there are matters of wider controversy. We believe that the references for each chapter are fairly comprehensive and those who wish to discover such views may best do so by referring to the original publications. Indian prehistory and protohistory are still a relatively new field of study and inevitably some parts are more developed than others. This uneven development is inescapably reflected in the book as a whole: there are still so many gaps to be filled and questions to be answered. As a result some chapters can be presented in a more digested form than others. The recent spate of radiocarbon datings makes it possible to place some periods in a more or less independent framework, while for others even the sequence remains largely hypothetical, or at best circumstantial. One of the most vital gaps of this kind, which we hope may shortly be filled, is the absence of carbon datings for later Stone Age industries. This means that it is extremely difficult to assess the relationship between the first settled communities in any region and groups responsible for the Late Stone Age industries, whom we assume to have lived by hunting and collecting, with the possible addition of pastoralism, or even shifting agriculture.

In collecting the material for this book we are indebted to a great many people and institutions. First, there are all those whose published works we have used, or who have supplied us with as yet unpublished information, or who have in discussion contributed to the formation of our ideas. Second, there are those individuals and bodies who have assisted us in various

During the first decades of the nineteenth century the recording of monuments had begun, and these records led up to James Fergusson's successive studies of Indian architecture. The discovery and publication of accounts of prehistoric remains also began in the first decades of the nineteenth century. Among the first to receive attention were the megalithic graves of the peninsula, stray hoards of bronze weapons from the Ganges–Jamuna Doab, and the ash-mounds of Mysore. The first recorded find of stone implements was in 1842, when a certain Dr Primrose discovered a 'bagful' of stone knives and arrow-heads during the clearing of his garden in the Raichur district, but it was eleven years later that John Evans published the first account of worked flints discovered on the Narbada river near Jabalpur.

The second half of the nineteenth century witnessed notable advances. In 1861 Major General Alexander Cunningham, at the age of forty-seven, retired from the army to become the first Surveyor General of the Archaeological Survey. During the next two decades his unflagging energy led him to explore hundreds of sites throughout North India from the frontiers of Afghanistan to Bengal. Among those which he discovered was the city of Harappa, and he published a plate of illustrations of stone blades and a typical seal inscribed in the unknown Harappan script. He visited site after site, recording plans of ancient cities, monuments of all kinds, inscriptions and other noteworthy discoveries, and he produced apart from the voluminous reports of his tours a number of special volumes on ancient geography, numismatics, etc. The work of Cunningham was largely in the field of historic archaeology, but the foundations he laid contributed to the later development of the Archaeological Survey of India.

In prehistory two other names stand out from this time. The first is Colonel Meadows Taylor who during the fifties carried out and published a number of outstanding excavations of megalithic graves in Hyderabad. The excellence of his excavation technique was perhaps outstanding in any country at that date. The other is the geologist Robert Bruce Foote, who has rightly been called the father of Indian prehistory. During the sixties, seventies and eighties he worked unceasingly in the field, and wherever his geological duties took him, he discovered archaeological treasure in the shape of Stone Age remains. In 1949 it was still true to say that almost every important prehistoric site in peninsular India owed its discovery to him. During the past decade Indian archaeologists have celebrated the centenaries of two great events: the foundation of the Archaeological Survey, and the discovery by Bruce Foote in 1863 of the first Indian Palaeolithic artifact from lateritic deposits near Madras.

We pass rapidly over the next decades. In 1901 the Archaeological Survey was reconstituted under the direction of Sir John Marshall, as a many-sided Government Department, equally concerned (in Curzon's striking words) 'to dig and to discover, to classify, reproduce and describe, and to cherish and conserve'. Marshall instituted a new series of Annual Reports, and an impressive series of excavations of historical sites, culminating in his work at Sarnath, Taxila and Sanchi. He filled the museums with the sculptures and other antiquities he discovered, and organized the first consistent work of conservation of the principal monuments of all parts of the country. Without doubt he may be said to have achieved Curzon's aims, but he did so with one notable exception, for apart from the excavations of Mohenjo-daro, Harappa and Chanhu-daro, during the years preceding 1945 the Archaeological Survey almost totally neglected exploration and research in prehistory and protohistory. What work was accomplished in this field was largely done by outsiders and amateurs. During this time however great advances were made in our knowledge of the Early Historic period and of Indian art and architecture. The excavations of the Indus valley cities are monuments of large-scale work, and anyone reading this book will realize how much we still owe to Sir John Marshall and his collaborators, but the Indus cities stood in isolation until 1945, and a great hiatus intervened between them and the civilization of the Ganges valley from the third century B.C. onwards. Moreover, in spite or perhaps because of their enormous scale, the excavations lacked precision, and to a large extent were undertaken without the framing of clear-cut objectives. Hence when they failed to answer such outstanding

questions as those of chronology or sequence, it was all too often because such problems had not been clearly posed at the outset of the work.

Two events of the 1930s stand out in terms of prehistoric research: in 1930 Mr M. C. Burkitt of Cambridge University published an account of the collections of a magistrate, L. A. Cammiade, from the Krishna basin, and in 1935 Professors H. De Terra and T. T. Paterson led the Yale–Cambridge Expedition to study the glacial sequence of Kashmir and the Punjab and to relate their findings to the prehistoric industries of the Punjab, the Narbada and Madras. One other development of Sir John Marshall's term of office deserves mention: it witnessed the first appointments of Indians to positions of responsibility in the Survey. Notable among those thus appointed were R. D. Banerji, to whom goes the honour of the first discovery of Mohenjo-daro, Pandit M. S. Vats, the excavator of Harappa and Mohenjo-daro, Daya Ram Sahni, the first Indian to become Director General of Archaeology, and N. G. Majumdar, the first excavator of Amri. Another man who contributed greatly to our knowledge of Indian prehistory during these decades was Sir Aurel Stein, whose continuing expeditions led him to Baluchistan and eastern Iran, the Punjab and the North West Frontier Province, no less than to the more remote regions of central Asia.

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Subbarao, who used it with increasing success in the two editions of his *Personality of India* (1956 and 1958). His untimely death robbed India of one of her most promising younger archaeologists.

So many excavations have been made, in many regions, that it is now possible – at least for the Neolithic and later periods – to base the regional sequences entirely upon them. Here, too, one is struck by the enormous advances that have been made since Piggott wrote. We have, as far as possible, relied upon excavations throughout, and only been forced to fall back upon other methods of establishing sequences when this sort of evidence is not yet available. Again, to establish a chronological framework, Piggott had to rely upon cross-datings often over very great distances to the sites of Mesopotamia or Iran, which were often themselves imprecisely dated by similar means. We have been able to employ the new fund of radiocarbon dates from both India and Pakistan to provide an absolute chronology, and thus to have a scale of dating undreamt of twenty years ago. It goes without saying that runs of dates from single sites are more likely to give accurate information than unique dates. We have unashamedly ignored dates which stand out of such runs as out of place, and also dates or even runs of dates which give consistently meaningless results: happily such dates are not common, and in some instances they seem to reflect the unreliability of the excavation rather than the fallibility of the method. The dates we have used have all been published, either in the annual volumes of *Radiocarbon*, or in the preliminary notes of the radiocarbon laboratory at the Tata Institute. We have found, in common with others, that for our purposes, for determination of later prehistoric dates, the calculation according to the half-life of radiocarbon of 5730 ± 40 years gives better results than the previously used half-life of 5568 ± 30 years. We have thus used the former throughout. Also we have in general not quoted the ± principle of error, but only the central date. The principle of error and the calculation according to both half-lives are however listed in the select list on pages 333–8. It follows that we have needed to place relatively less reliance upon cross-datings to establish chronology, and we have mainly used comparisons of this kind over only relatively short distances and within single cultural regions, where they may be employed with reasonable confidence. We have, however, also indicated certain of the more remote cross-datings when they appear relevant or of interest. In the several comparative sequence charts we have indicated divisions between periods with a firm line when they are related to radiocarbon datings, and with a dotted line in other cases.

In recent years there has been a certain amount of discussion of the terms which may most fittingly be used for the prehistory of India and Pakistan. Although it may be argued that such discussion becomes all too soon mere verbalism, we have been faced with a number of difficult choices, and hence we wish to explain the terms we have adopted. *Protohistoric* has often been used in two main senses: either to describe the Harappan civilization for which written records are available, even though not yet deciphered, or to describe the mainly post-Harappan cultures and periods about which certain inferences may be made on the basis of texts handed down orally, or only written at a much later date. We admit the value of both these usages, but we have not altogether followed them. We have treated the *Historic* period as beginning only when written documents or records of an historical character become available in any region: strictly this is to say that it begins in many regions with the edicts of Asoka in the third century B.C., but there is a body of near-historical material in for example the early Buddhist scriptures, for parts of north India from the time of the Buddha (*c.* 500 B.C.), and the Historic period may be extended back in such areas to about that time. We have called all cultures which precede the Historic period *Prehistoric*. This does not imply any disrespect for their levels of cultural achievement, but simply that they demand our attention as archaeologists rather than as historians. When, as happens in the Punjab, the Ganges–Jamuna Doab, and even the Central Ganges region, there is a growing certainty of the archaeological cultures to which the Rigveda or later Vedic literature originally belonged, we accept the relevance of the term *Protohistoric*.

With regard to the Stone Age, agreement was reached at the

Congress of Asian Archaeology in New Delhi in 1961 that in the existing state of knowledge the most satisfactory terms were *Early*, *Middle* and *Late Stone Age*. These were used to refer to the three major groups of stone industries recognized in the Indian subcontinent: the hand-axe industries; the flake industries which corresponds in very general terms to the Levallois–Mousterian industries of Europe and western Asia; and the various microlith-using hunting cultures. The last group corresponds, again very generally, to the Mesolithic of Europe and the Mediterranean. Thus in India there is no major phase corresponding to the Upper Palaeolithic blade and burin industries of Europe and western Asia. In this respect the main industrial groupings seen in India resemble those of sub-Saharan Africa: conversely one might say that, seen from a south Asian standpoint, the blade and burin industries are a specialized feature of temperate Europe and western Asia at the end of the Ice Age. This does not of course preclude the possibility that occasional blade and burin industries may be found in India, contemporary with the later flake industries, as they have been in East Africa and the Caspian region. The value of the terminology agreed in 1961 is that it rightly stresses in broad terms the threefold sequence of stone industries: this is of greater importance than the actual terms used. The terms Early and Middle Palaeolithic and Mesolithic, although they have often been used, and are readily understandable in our context, none the less carry strong European overtones, which can be misleading in themselves, and moreover carry the verbal implication that Upper Palaeolithic industries should follow those of the Middle Palaeolithic as a major cultural phase.

There has also been extensive discussion of the way in which the terms *Neolithic* and *Chalcolithic* are to be used in south Asia. In our view they largely overlap and therefore we have frequently used them in combination. However, the present data suggest that in Baluchistan, the southern Deccan and perhaps also Kashmir, at any rate, there is a period during which settled life, animal husbandry, and some form of cultivation, depended solely upon the use of stone, and these may thus be said to constitute primary Neolithic phases.

Equally there is a subsequent phase, beginning in Baluchistan and spreading through the subcontinent, in which copper and at a surprisingly early date, bronze, augment stone. This we may call Chalcolithic. In the south for instance the quantities of metal are very often small and stone still predominates, and it is a moot point – and not of very serious significance – whether we describe such cultures as Neolithic or Chalcolithic.

The quantity, importance and technological significance of bronze has never been on anything like the scale seen in the Bronze Age of Europe and many parts of Asia, and therefore we have rarely used this term. The terms Harappan, pre-Harappan and post-Harappan are used in two related senses, more narrowly for the culture of the Indus civilization and for that which preceded or succeeded it, and chronologically to designate periods corresponding to these over a wider area. Iron Age is used basically as a technological term and in no way coincides or conflicts with the boundaries between history and prehistory.

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Brahmaputra, and along the summit of which runs the frontier between India and Burma. They are the first of a series of ranges which run from north to south and extend from Assam to south China. They are divided by a corresponding series of deep river valleys and covered for the most part with thick forest. Much of the area has a high rainfall, and the



Figure 1. Map of the cultural regions of India and Pakistan

population is concentrated in the valleys. Although India has obviously been subject to a certain amount of influence from Southeast Asia and south China both in prehistoric and in historic times, the routes through the eastern mountains are difficult, as the Burma campaign during the last war showed, and few major conquests or movements of people into India appear to have taken place from this direction.

The central Himalayan region, which extends from Bhutan to Chitral, differs from the mountains of both the east and the west because behind it lies the great tableland of Tibet, cold, inhospitable and thinly populated. Trade contacts have long been kept up between India and Tibet but no major formative influences can be said to have come into India across this formidable frontier. In Bhutan and eastern Nepal the rainfall is as high and the forests as thick as in the eastern mountain region, but by the time one has travelled a thousand miles north-westward to Swat and Chitral the rainfall is much lower. The valley floors are fertile and intensely cultivated with the aid of irrigation from the perennial snow-fed rivers, and their sides are covered with small bushy plants and grasses, and occasional groups of trees which often extend to the tops of the mountain ridges.

Following the mountains south-westwards from here into the former North West Frontier Province (the ancient Gandhara), their slopes soon become almost completely bare. In this, the western mountain region, the valley floors are still irrigated and cultivated wherever possible, but they look like oases in a rocky desert. The mountains which enclose them are stark and bare and their slopes often consist of nothing but rock and scree. The desert conditions become more intense as one moves south-west into Baluchistan. But along these valleys and over the passes in these inhospitable mountains run the routes to central Asia and China on the one hand and to Persia and the west on the other. They have been trade routes throughout historic times and long before, and this is the way that invaders have many times poured into India. With trade and military conquest, great numbers of people and all kinds of external influences have also come. From the archaeologist's point of view, therefore, the western mountain region is by far the most interesting and most important part of the mountain zone.

Among the great routes from Iran into the plains of India we may notice the Gomal pass leading down from northern Baluchistan, the Bolan pass leading down from the fertile region of Kandahar (the ancient Arachosia) and the Quetta valley, the Kurram river and the Khyber pass leading from Kabul to

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is what one would expect, as the low-lying plains of Bengal with their high rainfall must originally have consisted of forests and marshes, which would have needed a considerable labour force, equipped with effective tools, to bring them under cultivation. The fertility of the alluvial soil, which now supports such a large population, must have made these areas more difficult to clear in the first place. The situation is probably analogous to that found in many parts of Europe where heavier and richer soils could not be, or were not, utilized until well into the Iron Age. Today the density of the population of the Ganges valley and the close proximity of villages to one another is almost oppressive, and already by the fifth century the poet Kālidās spoke of villages as 'a cock's flight' apart.

Passing from the plains up the first escarpment of the Vindhya hills one moves into a different world. Central India consists of a wide, flattened triangle of hilly country. The hills are nowhere very high, but they are steep and broken, with many escarpments and intersected by precipitous valleys. The ranges of hills tend to run in an east–west direction, except for the north-western extension of Central India, where the Aravalli hills run from south-west to north-east. These and certain other features are the result of earlier movements than those that formed the Himalayas, but some features are thought to be due to the secondary effects of the earlier phases of Himalayan folding. Due to its inaccessibility, and also to the relatively low fertility of much of its soil, Central India has been until very recently, and to a considerable extent still is, the resort of people who represent ancient ethnic elements in the Indian population, and also preserve archaic ways of life. These communities usually include certain later elements also, for in times of stress people from the more sought-after plains have found refuge with the 'tribal' people of the hills and have generally been absorbed by them. The hill tribes have also been subject to influences from adjoining regions from which traders and officials have come, and to which they go out as labourers. The Bhils of western Central India, for example, reflect the influence of several more advanced regions. The north-western Bhil groups, whose land adjoins Rajasthan,

reflect its influence in their dress and in many other details of everyday life, while those farther south reflect the dress and customs of their Marathi neighbours.

Central India is crossed by a number of routes, which link the more advanced regions surrounding it. Along these routes are settlement sites and small enclaves of village agriculture, many of which, like Tripuri on the Narbada near Jabalpur, go back to Chalcolithic times. The Malwa plateau lies in the angle between the Aravalli hills and those of Central India proper. Today part of the plateau is included in the state of Rajasthan. Settlements of the Chalcolithic period have been found widely distributed there, and it must be regarded as a separate subregion. Its position also means that it must have played an important part in the interrelationship of the Harappan culture with the Chalcolithic cultures of other regions, both to the south and east. On the east the Chattisgarh plain is another minor region contained within the forest belt of Central India. It consists of the fertile basin of the upper Mahanadi. The plain, which is surrounded by broken forest country, is almost entirely covered with paddy fields. It has a rainfall of 55 inches per annum, augmented by canal and well irrigation, and until the Maratha conquests in the eighteenth century it was an independent Gond kingdom.

Gujarat, lying at the western end of the Central Indian belt of hills, is another region of ancient settlement, and is rich in sites of every period from the Harappan onwards. It has always had considerable agricultural wealth, and today this is augmented by textile and other industries. It is centred upon the Gulf of Cambay, and consists of a low-lying plain which is enriched by the alluvium brought down from the hills of Central India by four great rivers, the Sabarmati, the Mahi, the Narbada (ancient Narmada) and the Tapti (correctly Tapi), together with the two peninsulas of Cutch (Kacch) and Kathiawar. Unlike the rivers which rise in the Himalayas, and carry a great deal of water derived from the melting snow in spring as well as that of the summer rains, the rivers of Central India and the peninsula carry only the water of the monsoon rains. But, as the rainfall in Gujarat ranges from 20 inches to over 60 per annum, perennial irrigation is not vital as it is in

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many other communities to Ceylon, Arab, Portuguese, Dutch, and British, to name only a few, and all these have added to the peculiar blend of the cosmopolitan and the parochial which constitutes her personality. The climate and agriculture of northern Ceylon are much like those of the Tamilnad. Tea and coffee are grown in the mountains of the south, which have a very high rainfall, and some minerals are mined in the central part of the island. There are also parts of the centre of the island which are rich in gem stones.

The people of each of the regions of India have their own character, which is as clearly marked and as constant as that of the country in which they live. Naturally their character derives largely from the country, and from their mode of life in it, which has developed over the course of time as they discovered ways of making their living from the resources it offered. Many features of such regional cultures, therefore, are clearly related to practical day to day needs, and to the materials locally available. Other features have no apparent relationship to local conditions. Some may have an historical explanation, but many are simply the result of local taste and tradition long established and often actively fostered. Anyone who travels about in India will quickly become aware of these cultural differences, many of which have great force and vitality, and which leave one in no doubt when one has passed a regional frontier. Not only are there changes in the countryside, but the dress and bearing of the people is different, and frequently also their language, for many but by no means all geographical and cultural frontiers correspond with linguistic frontiers. It is no exaggeration to say that the variations in manners and taste between any two major cultural blocks in India are as marked as those between any two major European countries.

From the point of view of the archaeologist the different regions of India have a twofold interest. Firstly many of their distinctive features are capable of being traced back in time, and the development and differentiation of regional cultures is the very stuff of archaeology. Secondly certain regions have advanced far more rapidly than others, and the more backward often preserve many features which elsewhere belong only to

a distant past. For example, city life and a system of fairly intensive agriculture have been established in the Ganges valley certainly for almost three millennia, and perhaps for somewhat longer. Yet in the adjacent hills and forests of Central India communities can still be found who live by primitive methods of shifting agriculture, augmented by hunting, and by gathering the natural products of the forests, such as honey, fruits, and various edible leaves and roots. Until the beginning of this century there were also communities who lived only by hunting and gathering, and small groups may be found who still do so, although the majority of such people now add to their livelihood by occasional labour and by selling forest products such as honey, or baskets and other things which they make. There are also communities such as the Bhils and Gonds who practise relatively advanced forms of agriculture, using ploughs, wheeled carts and draught oxen, and sometimes also irrigating their land, but who are yet outside the main body of Indian village life and peasant agriculture. All such communities are loosely known as tribal peoples. Many formerly independent groups of this kind can be seen in the process of being absorbed into the Indian village structure.

For the vast majority of the population of India the village is the mainspring of life. In the past it has supplied all the basic essentials of life for its inhabitants, and to a large extent it still does so. India's economy is primarily based upon agriculture: the subsistence agriculture of the peasant farmer within the structure of the village. The basic foods, rice, wheat, millets and pulses, are produced in varying quantities in different parts of India, and in many areas cotton is also produced for clothing and export. Textiles and spices have been India's chief exports since Roman times, and possibly also since Harappan times. Other things such as jute, tea and coffee, to mention only a few, have been added to these. The mining and export of gold and gem stones have also played a part, which it is not easy to estimate. Peasant agriculture, however, has always been the basis. It has provided the continuity and strength of Indian society in times of war and political stress, because any or every village can be entirely

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CHAPTER 3

THE EARLY AND MIDDLE STONE AGE

THE whole of the Indian subcontinent is rich in archaeological sites. The remains of cities, temples and settlements of every age abound, and pottery, stone tools or minor antiquities can frequently be found lying upon any stretch of bare ground, or in the newly turned soil of cultivated fields. By contrast most of northern Europe and northern Asia seem something of an archaeological desert. In many of the drier parts of India, as in the drier parts of Africa and western Asia, objects of considerable antiquity are often found lying on the surface of the ground, or immediately below it. This is due to the general tendency to erosion which prevents their being submerged by the top-soil. In temperate or equatorial zones where rainfall is distributed more evenly throughout the year the growth of plants and the formation of soil submerges small objects within a few months or years, and structures also become submerged in the course of time. In climates with a marked seasonal rainfall this is not the general rule, and although many antiquities are submerged by the formation of soil or the accumulation of alluvial silt, many also remain exposed, or are re-exposed by cultivation, erosion and the general instability of the soil cover. Stone Age sites, therefore, are both numerous and obvious in much of the Indian subcontinent, as indeed are the monuments and other remains of later periods. It is not surprising therefore that tools of the Early Stone Age were found and recognized in India only shortly after they had received official recognition in Europe.

It is now clear that the pre-Neolithic cultures of India fall into three major groups which in general follow one another sequentially throughout the subcontinent, and for which the terms Early, Middle and Late Stone Age are frequently used. The three groups represent a continuous process of development, subject at times to a greater or lesser degree of external influence; the lines which divide them are therefore arbitrary,

but there can be no doubt that the basic differences between them are real enough. There are also marked regional differences within these groups which we shall try to indicate as we go on, and it is highly probable that certain regions lagged behind others as they do today, so that in terms of absolute time there may have been considerable cultural overlap in the subcontinent as a whole: in some regions new techniques and tools and ways of life would be adopted, while in others old ways would continue for longer or shorter periods of time.

Bearing in mind these reservations, the three main divisions of the Stone Age can be briefly described as follows. The Early Stone Age group, about which we have as yet very little cultural information beyond that to be gained from the stone tools themselves, includes hand-axe industries which generally parallel those of western Asia, Europe and Africa, but with certain differences and exceptions which we shall consider. The principal tools are the hand-axe and the cleaver, core tools of discoidal and elliptical outline made in a similar manner to the hand-axes, chopping tools of various types, and flakes. The Middle Stone Age industries, which appear to have developed from those of the Early Stone Age, are all based upon flakes. Collectively they have a character which distinguishes them from flake industries elsewhere in the world, but they include a whole range of regional variants. The principal tools are now scrapers of several kinds, made on flakes, together with other flake tools and cores. We still have very little general cultural information, as tools of this period have only rarely been found in caves in the Indian subcontinent, and almost never with the kind of occupation deposit which indicates regular habitation. The one exception to this is Sanghao Cave in West Pakistan, where a series of flake industries have been found in massive occupation deposits. But this is in a region which is marginal in terms of India proper, and forms a transition zone between India and Central Asia. The industries of the Late Stone Age show clear signs both of continuity from those which preceded them, and of important external influences. The characteristic tools of the period are microliths. Regional variation is even more marked than previously, and now at last, in addition to the stone tools, there is a considerable body of

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may be influenced by factors of purely local significance. The effects of these disturbances are not so dramatic as in the Himalayan region, but they are sufficiently marked to be reflected in deposits laid down by the river. The stable region of peninsular India can be expected to give more reliable results which could perhaps be used as a control against which to assess sequences observed in the less stable regions. Work on the Godavari and its tributaries such as that done by Sankalia at Nevasa (1956), and by R. V. Joshi and others on various stretches of this river and its tributaries, and surveys carried out farther south have already made valuable advances in this direction. As pointed out by Vishnu Mittre and R. V. Joshi at a seminar held in Poona in 1964, it is to be hoped that surveys of ancient shore-lines on the east coast, now in progress, may in due course enable these to be related to the river terraces and stratified deposits of the eastward-flowing rivers of the peninsula. This will provide a framework to which other events and local sequences can be linked. Further, the analysis of pollens found in ancient soils, which is now beginning in India, should make it possible in course of time to get some idea of the climatic conditions in which these soils were formed, and so of the climatic pattern in India in early human times.

The cemented gravels referable to the beginning of each phase of aggradation very frequently contain considerable numbers of stone tools. Those associated with the first phase invariably belong to Early Stone Age industries, while those from the gravels of the second phase sometimes include a few of Early Stone Age types, but the great majority belong to the Middle Stone Age group of flake industries. Tools in the gravels of the third cycle of aggradation, where these are found, also belong to the Middle Stone Age complex, but to a very much more advanced stage of its development. The last point is demonstrated by the reduced size of both cores and flakes, and by a corresponding refinement of technique and variety of forms. Industries of the Late Stone Age are found in and immediately below the top-soil. Naturally, where subdivisions of any of the gravels occur, tools which they contain are of the greatest interest, as they provide evidence of sequential development within the first two major subdivisions. Tools of all phases are also frequently found on the surface where they have either lain exposed since their makers left them, or been covered for a time by soil, sand or silt, and then re-exposed. Some surface sites clearly belong to a fairly limited period, while others were continually or repeatedly exploited at several different periods. In both cases they can yield valuable evidence: factory sites provide one of the principal means for reconstructing the processes by which stone tools were made.

THE EARLY STONE AGE

There are clear indications that the hand-axe industries developed along lines comparable to those seen in Europe. This was shown in the south by Cammiade and Burkitt (1936), and in the north by de Terra and Paterson. The latter demonstrated that tools from succeeding terraces of the Soan river, a tributary of the Indus in West Pakistan, ranged from crude, heavy hand-axes and chopping tools made on pebbles in the upper terraces, to small finely worked hand-axes, cleavers, discoidal cores, flakes and chopping tools in the lower. The youngest industry they describe, the Late Soan, is a flake industry, which parallels the flake industries of the Middle Stone Age group found elsewhere in India. There is a high proportion of chopping tools, not only in the earliest Soan assemblages where they might be expected, but also in the more advanced phases of these industries. Indeed in all phases except the Late Soan they are a predominant type. Reliable statistics are not available for whole assemblages, but in certain of them chopping tools amount to more than half the finished tools, and in others very much more. According to de Terra and Paterson they show a progressive development comparable to that seen in the hand-axes and other core tools. A similar situation was reported by B. B. Lal (1956) from the valley of the Beas river, another tributary of the Indus, on the Indian side of the frontier. The Early Stone Age industries of south India are often termed Madrasian, because hand-axes and other tools were first found at Attirampakkam near Madras

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river, a tributary of the Godavari, were found to contain an industry which can be assigned to a late phase of the Early Stone Age on typological grounds, and exhibits many late-Acheulian features.

At present we can offer no explanation for the difference between the Early Stone Age industries of the north-eastern Punjab and those of other regions of India so far explored, and it can only be put on record as a factual observation. The adjacent regions of the former North West Frontier Province, and the south-westerly parts of both the Pakistani and the Indian Punjab are all unexplored from this point of view; so are the foothills of the central mountain region to the east, and the Ganges plains themselves. The affinities of the Soan industries with their high proportion of chopping tools therefore are still problematic: they may be related to the so called chopper-chopping tool industries of eastern Asia as suggested by Hallam J. Movius, or they may be a local phenomenon.

The majority of Early Stone Age tools found in all parts of the subcontinent are made of quartzite. Sometimes quartzite pebbles were used, particularly for making the earlier and cruder hand-axes, and for making chopping tools at all periods (Figure 3, Nos. 1, 2 and 6). The other source of quartzite was outcrops of rock and boulders. Factory sites where both pebbles and boulders of various sizes had clearly provided the raw material have been seen by the present writers on the terraces of the Soan valley in West Pakistan, and also recorded by other archaeologists in various parts of India. In order to make tools large flakes or pieces of quartzite had been removed from the parent rock. It was not always clear whether this had been done by striking the rock with another stone – an operation which would require great strength – or by fire-setting, that is lighting a fire against the rock and so causing large pieces to break away from the main body. Perhaps both methods were used. Some tools, usually cleavers, can be seen to have been made from flakes which had been struck off larger blocks of raw material (Figure 3, No. 4). But in the

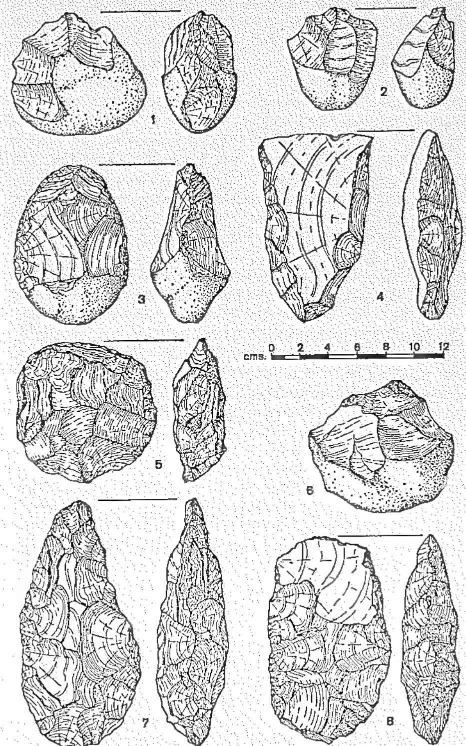


Figure 3. Early Stone Age tools

1–4, Soan valley, Punjab: 1 and 2, chopping tools; 3, hand-axe; 4, cleaver 5–8, Attirampakkam, Madras: 5, discoidal core; 6, chopping tool; 7, hand-axe; 8, cleaver.

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amounts of bone and charcoal and other cultural remains. Many of these contain only shallow deposits consisting of little more than a few inches of dust and microliths disturbed by the feet of sheltering herd boys and their animals. Some however have been found to contain a greater depth of occupation (Plate 1).

Two shelters, Jambudip and Dorothy Deep near Pachmari, were excavated in 1930, and in 1961–3 two more were excavated at Lekhania in Mirzapur district by the Department of Archaeology of Allahabad University. All these yielded Late Stone Age industries throughout several feet of occupation deposit, with a certain amount of sterile cave filling below. The Lekhania rock shelters contained a number of burials, and they are associated with further sites, near by in the open, which are apparently contemporary. A bone sample from one of the skeletons gave a C14 date of 1710 B.C. The stone industry shows certain sequential changes and developments in each case, the tools becoming smaller, more delicately made and more varied in the upper layers. Pottery also makes its appearance at a certain point, and becomes more frequent towards the top. At Modi rock shelter on the Chambal valley the sequence is much the same, but the Late Stone Age occupation begins from bedrock. In no case has an occupation deposit containing a Middle Stone Age industry been recorded. Therefore the relationship between the Middle and Late Stone Age traditions is still uncertain.

Rock shelters excavated at Adamgarh hill in the Narbada valley present a clearer picture. A few tools of earlier industries were found in and upon the surface of a stony deposit which in places lay under that associated with the Late Stone Age. The Late Stone Age tools are found throughout a thick layer of black soil which varies from 50 to 150 centimetres in depth, and which sometimes lies on the earlier deposit, and sometimes on bed-rock. As there were no recognizable layers in the black soil the finds were recorded in measured levels. Trench one, of which a detailed account is given by the excavator, yielded almost 5,000 artifacts. It was cut into an undisturbed level surface in front of the rock shelter. In addition to the stone industry there was a quantity of animal bones, mainly concentrated between 25 and 40 centimetres from the surface,

but also above and below this. Potsherds were found down to a maximum depth of 85 centimetres. Fragments of glass bangles were found at 20 centimetres, iron at 11 centimetres and haematite nodules at from 40 to 45 centimetres. There were also broken mace-heads and pebbles which appeared to have been used as hammer stones. Shells from between 15 and 21 centimetres have been dated by C14 to approximately 5500 B.C. – the first date so far for a primary Late Stone Age culture in the subcontinent. Of the stone industry R. V. Joshi writes:

> Points and blades together form the bulk of the microlithic implements. Each of these may be divided into several subtypes. The primary distinction in the case of points is whether the tool is made on a nodule, a flake or a blade. The points on blades, which constitute the largest number, are further distinguished by taking into consideration the extent and position of the retouch. . . . In the case of the blades the basic types are simple blades and retouched blades.

In addition to these two basic groups he lists lunates; triangles which as a group grade into points; and occasional trapezoidal forms. A variety of scrapers are made on flakes, blades and cores, and notable among the last are those made upon blade cores. 'Borers, awls and burins do not constitute major tool types . . . but their presence is significant on account of their specific functions.' The great majority of the cores found in the excavation as a whole are blade cores. The finds are listed in the table on p. 84.

The animal bones found in the excavation include the domestic dog (*Canis familiaris*), Indian humped cattle (*Bos indicus*), water buffalo (*Bubalus bubalis*), goat (*Capra hircus aegagrus*), domestic sheep (*Ovis orientalis vignei* Blyth race *domesticus*), pig (*Sus scrofa cristatus*). There are also remains of a number of species of wild animals. These are Sambar, Barasingha and Spotted deer, hare, porcupine and monitor lizard. Wild and domestic animals are represented in approximately equal proportions, and a few of the bones of cattle, pig and spotted deer are charred. The association of the microlithic industry with the bones of domestic animals in this context in Central India raises a host of questions, and some of these

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fine parallel-sided blades, as in Gujarat, but the quality of both the material and workmanship here is considerably higher. Indeed, the technical perfection of these industries seems quite beyond that demanded for utilitarian purposes. Many of the semi-precious stones such as agates which were used for making microliths in Central India are still employed by jewellers and bead-makers who obtain many of their best stones from the gravels of the Narbada and other rivers – the same sources which supplied the Late Stone Age hunters.

Rock shelters are fairly numerous in Central India, particularly in the Vindhyan sandstone which lends itself to their formation. A fair proportion of them are decorated with drawings upon the walls and ceilings (Plate 3), the majority executed in varying shades of purple, red and light orange-brown. Some clearly belong to later times, but many of the drawings are equally clearly associated with the hunting cultures of Stone Age or immediately post-Stone Age times. They show animals of many kinds, including deer or antelope, wild pig, rhinoceros, elephant, buffalo, humped cattle (*Bos indicus?*) and monkeys, the majority of which are clearly wild species, but a minority – chiefly cattle – might be either wild or domestic. Then there are human figures, sometimes together with animals in hunting scenes and other large compositions, and sometimes alone or in groups, and finally there are objects and designs less easily identified.

A tentative chronology has been put forward for the rock art of Central and peninsular India (Wakankar, 1963) based upon style, context, superimposition and general indications of antiquity, which shows that it must cover a considerable period of time. Hunting scenes and game animals seem to be shown throughout in various styles, while as time goes on other subjects such as armed or mounted figures and horse-drawn chariots also occasionally appear. If the cattle which are sometimes shown are domesticated, the question remains, were the Late Stone Age occupants of the caves pastoralists themselves or did they prey upon the herds of neighbouring peoples? A number of scenes seem to depict cattle raids or the waylaying of travellers, and there can be little doubt that the Late Stone Age cave dwellers of Central India flourished alongside the

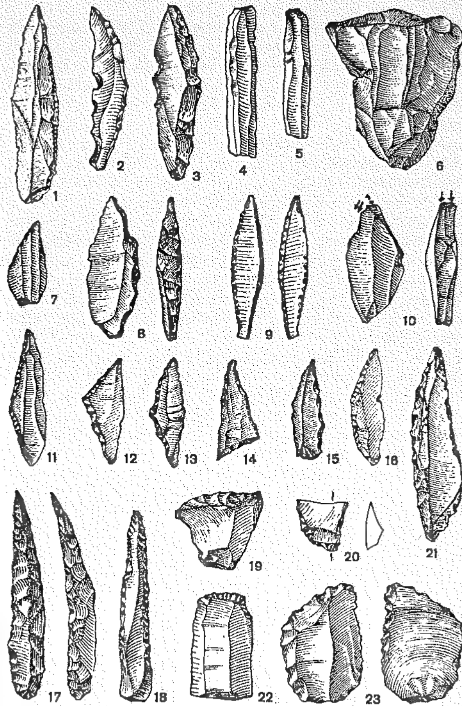


Figure 9. Late Stone Age tools from Adamgarh cave. 1:1

1, 3, and 21, backed blades; 4 and 5, blades; 2, 8, 11 and 16, lunates; 6, blade core; 9, double trimmed point; 12–14, triangles; 10, burin; 7 and 15, single trimmed points; 17 and 18, borers; 19, 22 and 23, scrapers; 20, transverse arrow-head.

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brick is still favoured, and hearths and bread ovens were found. There were three phases of occupation, of which the earliest (I) produced two radiocarbon dates of 2625 and 2528 B.C. and the second (II) three dates of 2554, 2425 and 2220 B.C. In the third phase a more ambitious structure with brick walls of monumental proportions was constructed. The material culture of the three phases is homogeneous; distinctive figurines of terracotta, both human female and animal forms, were found in periods II and III (Figure 16). Among the animals the humped bull with painted decoration was noteworthy. Two button seals of clay occurred in periods II and III (Figure 17),

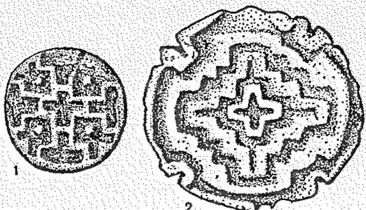


Figure 17. Damb Sadaat clay seals. 2:3
1, period II; 2, period III.

and copper objects in the earlier period included a dagger blade. Bone tools and a stone-blade industry, mainly of chert, continued, as did the alabaster bowls. The presence of numbers of grinding slabs and stone balls, perhaps used as corn-crushers, attests the preparation of cereals. Once again varieties of painted pottery proliferate, and the Quetta ware with its black-on-buff bichrome decoration shows numerous parallels with Mundigak III. The beginnings of this style are found in Damb Sadaat I and its elaboration continues through periods II and III. Polychrome decoration (named 'Kechi Beg polychrome' after the type-site) occurs in Damb Sadaat I and II; and a painted grey ware (named Faiz Mohammad grey) is another feature. A characteristic of the plain pottery is a surface roughening, as in

the Quetta 'Wet' ware, while another variety of this ware has circular stamping on the shoulder of the vessel. The similarities of form, fabric and design point to a general relationship between Damb Sadaat I–III and Mundigak II–III.

In the north-east lobe of Baluchistan, in the Loralai and Zhob valleys, further convincing concordances may be found. Here as yet there are no radiocarbon dates. At Rana Ghundai in the Loralai valley the second major period (II) coincides with an important change and the introduction of a new, finely made painted pottery with friezes of humped bulls in black, upon a buff-to-red surface. These vessels are frequently in the form of bowls or cups, often with a ring base or a hollow pedestal. Period III follows, and is divided by its excavator into three sub-periods. The division was traced by him in a stylistic evolution of the painted pottery. In IIIA appears a bichrome painted style with red-on-red tones, occurring also nearby at Sur Jangal in period III. In the upper levels of this period there appear a number of wares with parallels in Quetta, including the 'Wet' ware, polychrome akin to that of Kechi Beg, and a painted style akin to Faiz Mohammad ware. The third period ended with a conflagration and was replaced by a very different potting tradition. A larger excavation is required to provide a more certain chronology for the Loralai valley.

From the Zhob valley in the extreme north of Baluchistan further evidence comes from the site of Periano Ghundai, excavated by Sir Aurel Stein in 1924 and revisited in 1950 by Fairservis. The earliest phase here seems to coincide with Rana Ghundai IIIC. The finds include leaf-shaped bifacial arrowheads, stone blades and female figurines of the sort commonly known as 'Zhob Goddesses'. A distinctive type of surface roughened ('Wet') ware again suggests its date. Another special feature of Periano Ghundai was the large terracotta figurines of humped bulls. The assemblage from this site is discussed in greater detail by Piggott and Fairservis.

In central Baluchistan, de Cardi's recent work at Kalat provides a valuable extension of our knowledge of this period, or at least of its earlier half. Anjira III seems to coincide with Damb Sadaat I–II, and Anjira IV with the flowering of Damb Sadaat II–III. Here the principal painted pottery was that

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whole the pottery of Fabric A is distinct, while that of Fabrics B, C, D and E is closer to that of Kot Diji and Amri, both in point of manufacture and of painted decoration, with plain bands of red and black. An extensive series of radiocarbon samples has been obtained at Kalibangan, those for the pre-Harappan period ranging between 2370 and 2100 B.C. A cluster of six between 2100 and 2000 B.C. gives dates for the beginning of the Harappan period provocatively close to that obtained at Kot Diji.

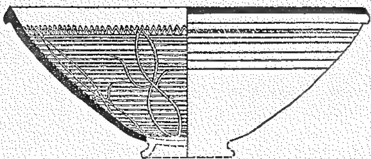


Figure 22. Kalibangan, pre-Harappan bowl, fabric D. 1:8

In his explorations in 1950–53 Shri A. Ghosh, the former Director General of Archaeology in India, discovered many sites in the valley of the Ghaggar river and its tributary the Chautang, producing a pottery which was apparently identical to the pre-Harappan pottery of Kalibangan. This complex he named the Sothi culture, but so far little has been published regarding it, and it remains a somewhat shadowy entity.

To summarize the evidence presented in the previous pages. The earliest settlements so far reported in the whole Indian subcontinent are in the upland valleys of Baluchistan and southern Afghanistan. At a somewhat later date, probably around the opening of the third millennium B.C., a cultural complex named after the type-site of Amri appears in the piedmont zone to the south-east of Baluchistan, abutting on the Indus flood-plain. A distinctive settlement pattern, still if we may judge from the material culture having its primary links with Baluchistan, developed there and after a series of evolving stages gave way to a culture of purely Harappan type. Further north at Kot Diji and Harappa a somewhat similar culture is

indicated as developing, perhaps slightly later, in settlements beneath the Harappan levels. The pottery of these two sites is distinguishable from that of Amri both in the relative austerity of its painted decorative patterns and in its range of forms; but it is still largely wheel-thrown and still suggests Baluchi ancestry. Finally at Kalibangan a comparable sequence is observed, probably having a life span slightly later than or nearly contemporary with that of Kot Diji, but possessing a pottery which introduces many new painted motifs and a rather wider, and incidentally less closely Baluchi, range of forms.

In all these cases the material culture provides hints of an intermediate period when forms and motifs emerge which are later identified as Harappan. At Amri and Kot Diji there is important evidence of a general destruction by fire coinciding with the emergence of the new 'Harappan' culture. What is particularly exciting in these recent excavations is the repeated evidence of continuity from pre-Harappan to Harappan times, suggesting that a large if not a major element in the Harappan civilization must derive from the pre-Harappan culture of the Indus valley itself. Another interesting feature is the evidence of massive fortification walls in the pre-Harappan period. The destruction at Kot Diji may nevertheless indicate that the actual transition from the pre-Harappan culture to the Harappan coincided with attack from outside. It remains to comment upon the already considerable uniformity of culture over so wide an area during this pre-Harappan phase. When the indications of further settlements around and between the excavated pre-Harappan sites are taken into account, it may be concluded that there were at least three subregions of this culture: the central, including Kot Diji and Harappa, and hypothetically also Mohenjo-daro; the southern or Amrian with closer ties with southern Baluchistan; and the eastern or Kalibangan with suggested (and still largely hypothetical) affinities with a pre-Harappan Indian culture phase. This leads us to frame certain very interesting questions. For instance, how large did the settlements at the central sites become, and did they already contain the essential elements to warrant their being regarded as cities? What were the Indian cultures which influenced the Kalibangan province, and what in turn were

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in the Punjab. The vast mounds at Harappa were first reported by Charles Masson in 1826, and visited by General Cunningham in 1853 and 1873. Their rediscovery some sixty years later led to the Archaeological Survey's excavations between 1920 and 1934, directed by Pandit M. S. Vats. A short but important further excavation was made in 1946 by Sir Mortimer Wheeler: the natural soil was reached and evidence of a pre-Harappan culture phase revealed. In the earlier excavations of both these sites a mass of information was obtained relating to their planning and architecture, and much material relating to arts and crafts and to the way of life of the people was recovered. However, the excavations prior to 1947 did not achieve a satisfactory picture of the development of the cities, and in the absence of radiocarbon dating no absolute chronology was obtained.

A second series of sites have in some cases features which recall the basic layout of the cities, and although smaller, they may reasonably be regarded as provincial centres of government. Among them several have been excavated. Most recent in point of time is Kalibangan, where extensive excavations of the Harappan township are still in progress. From the viewpoint of technical excellence this work is among the finest so far done in the subcontinent and does credit to the Indian Archaeological Survey. Kalibangan shares with Harappa and Mohenjo-daro the layout of citadel and lower town, and it has produced a series of radiocarbon datings (Figure 70). At Kot Diji the excavators also treat the site as comprising a citadel and outer town of Harappan style. It was excavated in 1958, but the publication is somewhat unsatisfactory. Other large sites which may also be included in this category are Sandhanawala in Bahawalpur and Judeirjo-daro in Sind north of Jacobabad, but these have not as yet been excavated, nor has the great mound at Dabar Kot in the Loralai valley of north Baluchistan, apart from trial trenches made by Sir Aurel Stein. Farther south in Sind are Amri and Chanhu-daro, the former on the right and the latter on the left plains of the Indus. The French excavations have revealed much interesting information at Amri and have shown not only the pre-Harappan development, but also three distinct phases of Harappan occupation, as well

as an immediately post-Harappan period. Chanhu-daro was excavated in 1935–6 by Mackay and produced a great deal of interesting material relating to the two latter periods.

Among other excavated sites we may mention Sutkagen Dor on the Makran coast where Sir Aurel Stein dug some trial trenches. More recently Dales has shown the existence of a great fortification around the Harappan outpost there. Perhaps the most important excavation of the post-war period has been that at Lothal. Here the Indian Archaeological Survey's team, under the direction of S. R. Rao revealed a great artificial platform with streets and houses of regular plan, and a series of building phases which have been dated by a number of C14 samples. Beside the township was discovered a remarkable brick dockyard connected by a channel to the gulf of Cambay (Figure 67). Two other smaller sites excavated in recent years are Rojdi in Saurashtra, and Desalpar in Cutch (Kacch) district. Both provide evidence of an initial occupation in the Harappan period, and of continuing occupation during post-Harappan times. Finally mention may be made of two outlying sites at Rupar in the Punjab and at Alamgirpur in Uttar Pradesh, at both of which recent excavations have established the presence of Harappan or late-Harappan settlements. The extension of the civilization eastwards towards the Ganges–Jamuna Doab raises various interesting possibilities which must await the research of coming years.

As a result of more than thirty years of excavations at these sites, there is a great body of evidence relating to the life of the civilization which produced them. Much of the detailed description will be given in later chapters, but here we shall summarize the main outlines which present themselves to the observer. Our overwhelming impression is of cultural uniformity, both throughout the several centuries during which the Harappan civilization flourished, and over the vast area it occupied. This uniformity is nowhere clearer than in the town-planning (Plates 10A and 10B). The basic layout of the larger settlements, whether cities or towns, shows a regular orientation, with a high citadel on the west dominating the lower town (Figure 66). Probably the latter was originally more or less square. Equally careful was the oriented grid of streets

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of religious significance for the Harappans. There is a suggestion of a religion dominated by one great God, who convincingly shares many of the traits of the later Śiva, being a *Yogi*, a Lord of Beasts, whose cult was associated with fertility and the *lingam*, and who in later times had the epithet *Mahādeva* (great God) (Plate 14, No 2), and by a great Mother who equally shares traits of Parvati, the spouse of Śiva known also as Mother, and Devi, the Goddess. There is an indication of the cult of trees or tree-spirits, and of the special significance of various animals (Plate 14, No 5). Taking all in all, we are left with a very clear sense at least of elements of the Harappan religion, and we cannot fail to see in them much that continues in subsequent Hinduism.

The information that has been gathered on such topics as the economy, social system, government or religion, was largely the product of chance finds in the earlier excavations. It is to be hoped that as archaeological research in India and Pakistan advances further excavations may be conducted with the aim of answering specific questions and elucidating specific problems.

The earlier excavations at Mohenjo-daro and Harappa revealed surprisingly little clear evidence of the Harappan burial customs. However, in the final seasons at the latter site Vats discovered the post-Harappan Cemetery H (to be discussed below), and between 1937 and 1941 a second, Harappan burial ground known as Cemetery R 37. Both these were further investigated by Wheeler in 1946. Since 1940 three other Harappan cemeteries are reported, although none is yet published; at Derawar in Bahawalpur, discovered by Stein, at Lothal, and at Kalibangan. The two latter have been excavated. It appears that the predominant burial rite was extended inhumation, the body lying on its back with the head generally to the north. Quantities of pottery were placed in the graves, and in some cases the skeleton was buried with ornaments. A number of graves took the form of brick chambers or cists, one at Kalibangan being of unusual size (4 × 2 metres), and from Harappa is reported a coffin burial with traces of a reed shroud. At Kalibangan two other types of burial were encountered: smaller circular pits containing large urns, accompanied by other pottery, but, perplexingly, no skeletal remains, at any rate in the examples so far excavated; and more orthodox burial pits with what are evidently collected bones. From the Lothal cemetery comes evidence of another burial type with several examples of pairs of skeletons, one male and one female in each case, interred in a single grave (Plate 18 B). It has been suggested that these may indicate a practice akin to *sati*. Until more is published, or further research is done, it does not seem possible to add to Marshall's speculations regarding the burials inside Mohenjo-daro itself, but it is evident from all these other finds that the regular cemeteries wherever they have been discovered were disposed around the perimeter of the settlement.

We shall now turn to a more detailed discussion of Harappan chronology and internal development, and the circumstances of the downfall of the civilization. The first estimate of the duration of the occupation at Mohenjo-daro was made by Sir John Marshall in 1931. His estimate, based upon general concordances with Mesopotamia, was from 3250 to 2750 B.C. In the following year C. J. Gadd published a paper listing a number of Indus, or Indus-like, seals discovered in Mesopotamian sites, particularly Ur, and discussing their ages. Here, apart from two examples which were listed as pre-Sargonid, the majority of finds of seals belonged to the Sargonid and Isin–Larsa periods, and might therefore be expected to indicate active trade contacts between 2350 and 1770 B.C. A few seals were also found in Kassite contexts indicating a yet later date. Since then Piggott (1950) and Wheeler (1946, 1960, etc.) have reviewed the evidence, including cross-dates to the as yet imprecisely dated sites of Iran (Hissar, Giyan, etc.), and other categories of objects apparently imported into Mesopotamia, etched carnelian beads, stone house-urns, etc. There has been general agreement upon an overall span of 2500–1500 B.C. with principal trade contacts with Mesopotamia between 2300 and 2000 B.C. In the past twenty years little additional evidence has come to light to change this view, so far as archaeological crossdatings are concerned. However, in 1955 Albright concluded that the end of the civilization must have been around 1750 B.C. in order to coincide with Mesopotamian evidence. The

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all the findspots of these seals and of objects supposedly imported into Mesopotamia from the Indus region, Frankfort's excavations at Tell Asmar in the Diyala valley supply perhaps the most convincing evidence of the age. But there seems even so to be some latitude in the interpretation of the evidence. According to Buchanan the earliest seals and imports are not earlier than the late Agade period, and he concludes that 'the Mesopotamian evidence therefore does not require a date for the mature Indus civilization much, if at all, before the twenty-third century B.C.'. If this conclusion is correct, it means that there is no substantial conflict between the Indian and Mesopotamian evidence.

At almost every site of the Harappan period there is at least some evidence of internal development. Unfortunately much of the earlier work at Mohenjo-daro and Harappa was of such a kind that its analysis is now scarcely possible, while the more recent work at Kalibangan or Lothal is still incompletely published. It is thus not easy to make a close comparison of the development at each site, although one is led to feel that parallels might be found, if only more evidence were available. At those sites where excavation has revealed a pre-Harappan phase below the Harappan (Amri, Kot Diji, Kalibangan) there is in each case an indication of cultural continuity. Even when at Kot Diji a massive burnt layer intervenes, the evolution of decorative motifs on pottery continues. At the same three sites there is further a transitional level in which both styles of pottery are found together. Of this level there is no evidence at Chanhu-daro or Mohenjo-daro, as the height of the subsoil water prevented excavation below a certain point, but at Mohenjo-daro Mackay's deep digging in Block 7 of the DK area revealed an early period, related by him to the 'Early' eighth stratum of Marshall on the Citadel mound, which produced some pottery of non-Harappan type, for example some incised comb decoration, recalling the pre-Harappan Fabric D at Kalibangan. This may indicate that the early period reached in the excavation at Mohenjo-daro goes back to the transitional phase of the other sites.

At Harappa, Mohenjo-daro and Chanhu-daro the early period ends with the massive brick platforms of the citadel

areas, and above are found the remains of the high period of the civilization. At Mohenjo-daro this included three principal structural levels of Marshall's intermediate period and was succeeded by a great and disastrous flood, and by three levels of the late period; at Harappa there were six structural levels of which the uppermost produced some pottery of Cemetery H type. At Kot Diji there are also apparently six or seven building phases within the Harappan period, while at Kalibangan nine are reported. At almost every site there succeeds a 'late' period during which planning and construction decline, brickbats from former houses are reused, new motifs appear on pottery, etc. This is generally seen as a decline, though whether associated with natural calamities or with political factors is still far from clear.

Around 1750 B.C. the uniform culture of this great area broke up: apparently with different results in Sind and the south, and in the Punjab and the north. What was the cause of this breakdown? Several causes have been suggested. Lambrick has recently proposed that calamitous alterations of the course of the Indus above Mohenjo-daro may either have driven population from desiccated areas to Mohenjo-daro, or have caused the desiccation of the lands around the city, and thereby weakened it, making it an easy prey to barbarians from the west. Marshall and Mackay stressed the repeated flooding of the city, and saw too in the vagaries of the Indus a possible cause of decay. This view has recently been modified by Raikes who, as a result of his study of the exposed flood-deposits and borings made at Mohenjo-daro, and of related observations elsewhere, has invoked tectonic movements downstream as responsible for mighty lake formation and silting. All three of these theories need not entirely exclude one another. But Raikes's theory raises serious difficulties which require elucidation before we are ready to accept it. Marshall, who dated the civilization almost a thousand years earlier than we have done, saw no connexion between its downfall and the Aryans. But Childe (1934) and Wheeler (1946) have shown that with revised chronology there is every possibility of invoking Aryan, if not Rigvedic Aryan, agency for the destruction. The unburied skeletons lying in the streets of

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major break, with a distinct culture named after the type-site of Jhukar. The most extensive evidence of invasions was discovered at Chanhu-daro. Here a shaft-hole axe (Figure 31, No. 1) and copper pins with looped or decorated heads recall Shahi-tump and more significantly Hissar III*b*. Circular, or occasionally square, stamp-seals of stone or faience again recall Hittite parallels from Asia Minor, and also Shahi-tump. Another foreign trait is a small cast bronze cosmetic jar (or mace head) comparable to examples from Luristan and Hissar III. In contrast to such objects the distinctive Jhukar pottery, a buff ware with red or cream slip often in bands, and bold painting in black, suggests a real degree of continuity with local Harappan and even west Indian traditions, and leads us to infer that a substantial element of the population survived the invasion. The picture in this way is generally comparable to that of Saurashtra although the two regions show important differences. By contrast with the Harappan pottery, a fair proportion of the Jhukar ware gives evidence that it was finished by beating, after removal from the wheel. This later becomes a typical Indian potting technique.

At Mohenjo-daro direct evidence of a Jhukar occupation is wanting, perhaps because of natural causes, but on the other hand the numerous groups of hastily buried or unburied corpses left in the streets of its final occupation, and the buried hoards of jewellery and copper objects seem testimony enough to the proximity of foreign barbarians. More precise evidence of their presence at Mohenjo-daro in the upper levels is found in the copper shaft-hole axe-adze, whose Iranian parallels date from *c.* 1800 to 1600 B.C. (Figure 31, No. 7); while two dirks and two daggers with thickened mid-rib and rivet holes, are also of this time (Figure 25, Nos. 5 and 9). We shall see below that thickened mid ribs of bronze and copper appear to have spread into the peninsula of India between 1500 and 1300 B.C. The bronze pin with spiral loop, found by Mackay at a depth of 18·4 feet in the DK area, must indicate an earlier importation, and so too may the animal-headed pin discovered in the same part of the site. Their Iranian or Caucasian origin nevertheless seems established.

At Chanhu-daro and at the mound of Jhangar on the other

side of the Indus, the Jhukar phase is succeeded by one producing a poor grey-black burnished pottery with incised decoration. This ware is quite different from the earlier painted traditions, and no other evidence of the material culture of its makers is known. An inferior painted ware is also found. Some of the Jhangar forms, and more particularly the incised patterns, are reminiscent of those occurring in paint in Saurashtra at Rangpur and Somnath, during our phase 4 (see page 182), and may thus be expected to date to *c.* 1000 B.C. In Saurashtra too, incised grey ware, often of crude make and of related forms is found. The most distinctive 'Jhangar' form from Chanhu-daro was a triple jar whose analogues are at Shahi-tump and Sialk, Necropolis B, thus reinforcing our view of the date.

The period coinciding with the end of the Harappan civilization in the north of the region, in the Punjab, is of a rather different character from that of the Sind, and may well prove of fundamental importance to our understanding of later Indian civilization. A bronze animal-headed pin found at Harappa near the surface in area J suggests connexions with western Iran and the Caucasus between 1500 and 2000 B.C. All over the citadel mound at Harappa, and in the topmost stratum of the area F immediately to the north, Vats discovered a decadent period of structures of reused brick, and pottery including a significant quantity similar to that discovered in Cemetery H (see pages 313–14). Even in the second stratum of the citadel mound instances of pottery of this sort were noted. As this pottery is clearly identified only in the cemetery, we propose to refer to the culture to which it belongs as the Cemetery H culture. Wheeler showed conclusively by his excavation in 1946 that the cemetery bore a stratigraphic relationship to the cemetery (R37) of the Harappan period. Between the two there intervened a great mass of debris, mainly Harappan pottery, including some late-Harappan forms such as footed goblets. Above and into this debris burials of Cemetery H were dug at two levels. In the lower (stratum II) were extended inhumations accompanied by quantities of pottery, while in the upper (stratum I) were fractional burials in large urns, without accompanying grave goods. It has not so far been definitely established whether these two are contemporary, or whether

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to distinguish it) is not mentioned in the Rigveda, but in later Vedic literature, from the time of the Atharvaveda and the *Samhitas* of the Yajurveda, it becomes increasingly common.

The Vedic hymns are addressed to Indo-European gods such as Indra, the warrior charioteer whose thunderbolt destroyed their enemies and who brags of his inebriation on the sacred *soma* drink; Agni, the fire god, who also shares something of this warlike character as the consumer of the enemy, as well as being the intermediary between gods and men; Varuna, the Asura or righteous king; Mitra, with solar characteristics, and so on. Their cult revolved around the fire sacrifice. The Aryan funeral rites are of interest: cremation and burial were evidently both in vogue.

The geographical horizons of the Rigveda are relevant to our inquiry. On the west they are bounded by the western tributaries of the Indus, the Gomatī (modern Gomal), the Krumu (modern Kurram) and the Kubhā (modern Kabul) rivers. Other rivers are mentioned even to the north of the Kabul, notably Suvāstu, the modern Swat. This latter signifies 'fair dwellings' and may therefore indicate Aryan settlements in this beautiful valley. The centre of Rigvedic geography is the Punjab. The rivers most often referred to are the Indus itself, the Sarasvatī and the Drishadvatī and the five streams which collectively gave their name to the Punjāb (five waters), the Śutudrī (Sutlej), Vipās (Beas), Parushnī (Ravi), Asiknī (Chenab), and Vitastā (Jhelum). The eastern horizons are the Jamunā river and at the end of the period the Ganges.

From the Veda it is evident that the Aryans were not the only inhabitants of the region, for which they themselves used the name *Sapta-Sindhava* or land of seven Indus rivers, and that their original stay was not entirely peaceful. We learn of a people called *Dāsas* or *Dasyu* (the word later means 'slave') who were dark-complexioned, snub-nosed, worshippers of the phallus (*śiśna deva*), etc. They were rich in cattle and lived in fortified strongholds, *pura*. We learn of another people, the *Panis*, who were also wealthy in cattle and treasures. Although many of the hymns refer to battles between one Aryan tribe and another there is an underlying sense of solidarity in the

fight against the Dāsas, and Indra is named *Purandara*, the 'breaker of cities'. Already in the Veda the first encounters of Indra (the Aryan people personified) and the fortified settlements of the Dāsas were being forgotten and the Dāsa rulers were regarded as demons. We hear of a city named Nārminī destroyed by fire, and of a battle on the banks of the Ravi at a place named Hariyūpīyā (which Indologists are ever more confidently identifying with Harappa). Professor Burrow has recently shown the unambiguous character of such references as, 'Through fear of thee the dark-coloured inhabitants fled, not waiting for battle, abandoning their possessions, when, O Agni [fire], burning brightly for Puru [an Aryan tribe], and destroying the cities, thou didst shine' (VII. 5.3). He has further recognized the importance in both the Rigveda and later Vedic texts of the word *arma*, *armaka*, meaning ruin. For instance, in the Rigveda we read, 'Strike down, O Maghavan [Indra], the host of sorceresses in the ruined city of Vailasthānaka, in the ruined city of Mahāvailastha [Great Vailastha]' (I.133.3). There were then, in the time of the Rigveda, great ruin-mounds which the Aryans associated with the earlier inhabitants of the area. The same idea recurs in a later Vedic text, the *Taittirīya Brāhmana* (II. 4, 6, 8), in the statement that, 'The people to whom these ruined sites belonged, lacking posts, these many settlements, widely distributed, they, O Agni, having been expelled by thee, have migrated to another land.' Also in one of the later Vedic texts we read, 'On the Sarasvatī there are ruined sites called Naitandhava; Vyarna is one of these'; and, for the archaeologist perhaps even more suggestively, 'He should proceed along the right bank of the Drishadvatī, having reached the ruined site near its source he should proceed towards the right,' etc.

Such, briefly, is the picture presented by the Rigveda. It provides us with a geographical provenance and with two fairly sure termini, the overthrow of the Harappan cities, in *c.* 1750 B.C., and the introduction of iron around 1050 B.C. Against this evidence we must consider that of archaeology, both the earlier and less positive part discussed in this chapter and the later part discussed in the following chapter. Archaeo-

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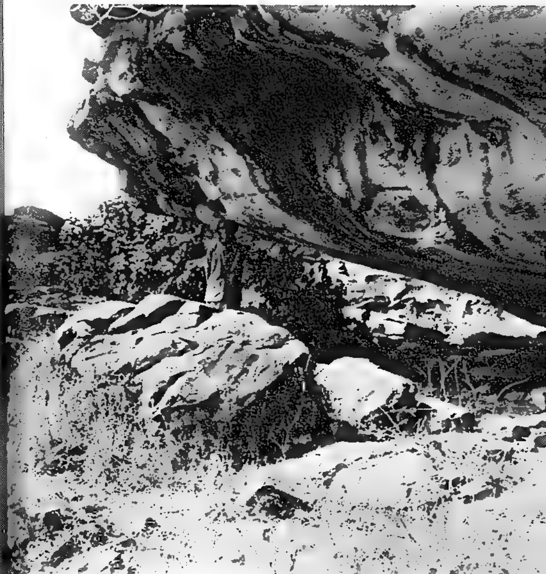
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their owners. Another peculiar feature without parallel in the subcontinent was the evidently purposeful burial of animals, such as dogs, wolves or ibex. A third period, associated with the construction of a massive megalithic circle or part-circle, saw a new pottery of coarse red ware replacing that with grey or black burnish, although apparently there is still no evidence of the presence of iron. Exploration has revealed about nine other sites of the Burzahom culture in the adjacent terraces of the Jhelum river. Further finds of ground stone axes in Kangra district probably belong to this group.

In discussing the origins and affinities of the Northern Neolithic, certain things at once strike the eye as foreign to the Indian tradition. Among them are the forms of the bone tools, the rectangular perforated stone knife, the pit-dwellings, and the placing of domestic dogs in the grave with their masters. Each one of these features is found in Neolithic cultures of north China, the perforated knife in particular being a characteristic trait, and a dog burial is reported in the Ang-Ang-Hsi culture of Manchuria. The dog was apparently almost a cult animal in the Shilka cave culture of the upper Amur; and dogs were until recently sacrificed and buried with their owners among such peoples as the Gilyaks, Ulchis and Goldis of this region. A bone industry, including harpoons, is also a frequent occurrence of north Chinese Neolithic sites. The Burzahom axe industry is of an unspecialized sort which may as lief be compared with the collections of the Swedish Expedition to Mongolia, as with anything Indian. On the other hand, the Burzahom ceramic industry is not obviously comparable with any Chinese Neolithic pottery. In short, the Burzahom 'Neolithic' appears as a sort of hunting-based culture whose affinities are with the 'Neolithic' and surviving hunting people of the peripheral regions north and north-west of China and of Central Asia. Another feature which demands consideration is that although this culture must have coexisted with the pre-Harappan and Harappan developments in the Indus valley and Punjab, there is no indication that the two enjoyed any contact whatsoever. The question of relations with the other Indian Neolithic groups is more problematic, and we leave it on one side for the present.

1 Baghai Khor, Mirzapur district: a typical Central Indian rock shelter



2 (*below*) Vedda family encamped in a rock shelter, Ceylon

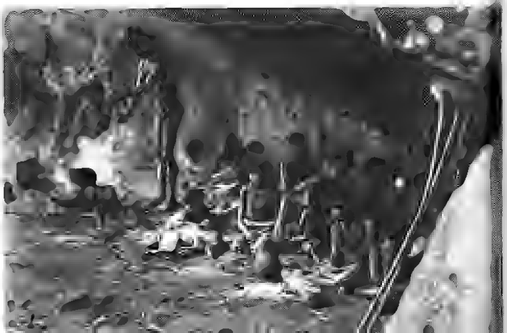
OPPOSITE

3 a (*above*) Chariot group, Morhana Pahar, Mirzapur district

b (*below*) Rock painting of a band of animals, perhaps goats, from same site









4 A (*left*) Sculptured head in limestone, Mundigak, period IV (height 9.3 cm.)
B (*below*) Palace building from Mundigak, period IV, Afghanistan

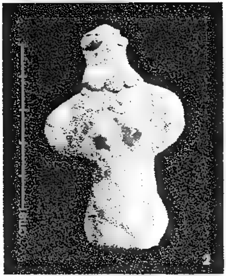
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5 A (*above*) Painted pots from Mundigak, period III.6
B (*below*) Painted pots from Mundigak, period IV



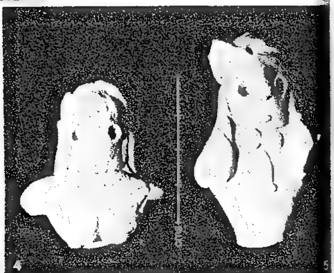




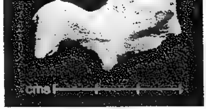


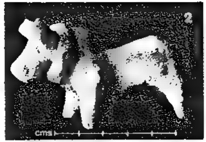


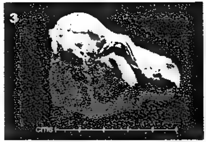




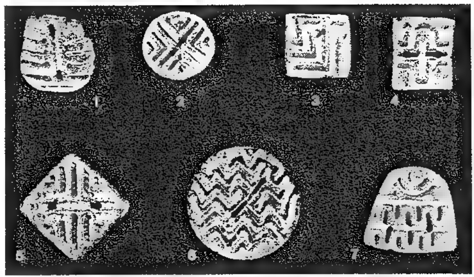
6 Female figurines of terracotta, Mundigak: 1, period III.1; 2–4, period IV.1; 5, period IV.2











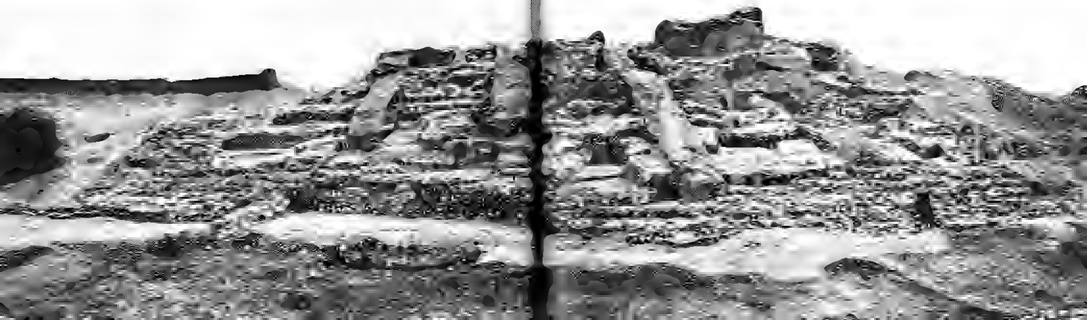
7 A (*left*) Cattle figurines of terracotta, Mundigak: 1, humped bull, period II.2; 2, humped bull with collar, period IV.2; 3, head of bull, period IV.1; 4, painted humped bull, period IV.3
B (*below*) Stone button seals, Mundigak: 1, period II.2; 2–4, period III; 5–7, period IV



8 A (*left*) Pre-Harappan painted pottery from Kalibangan
B (*below*) Kot Diji, general view of excavations. The stone foundations of the pre-Harappan defensive wall are visible in the foreground

OPPOSITE
9 (*above*) Pre-Harappan settlement beneath Harappan citadel, Kalibangan



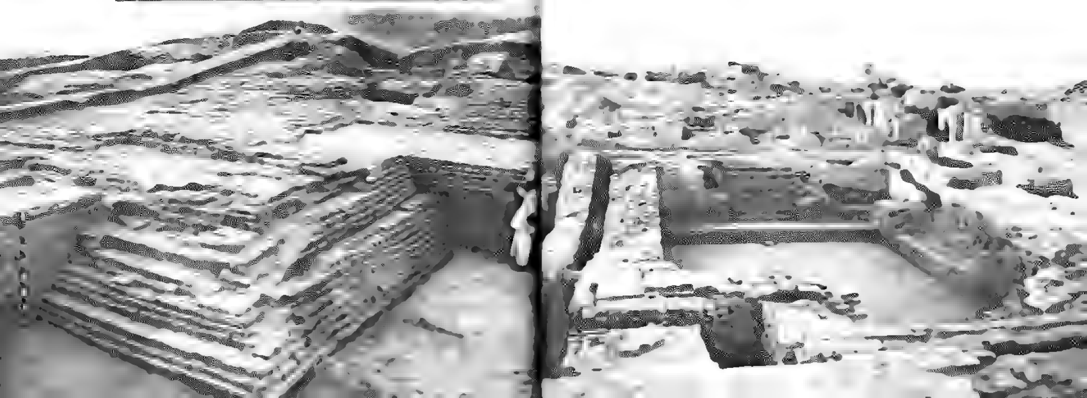




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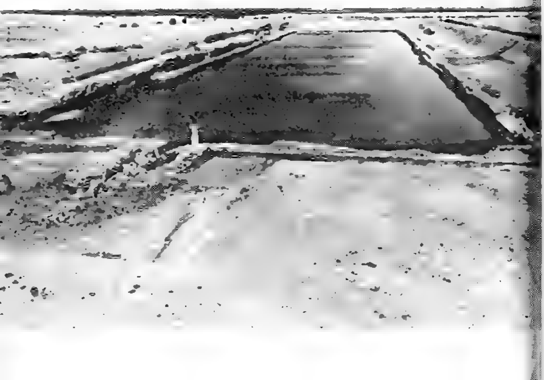
10 A (*above*) Street and houses of Harappan period, Kalibangan
B (*below*) Remains of brick rampart of Harappan citadel, Kalibangan

11 (*below*) Mohenjo-daro: the great bath









12 A (*above*) Mohenjo-daro: representation of ship on a stone seal (length 4·3 cm.)
B (*centre*) Mohenjo-daro: representation of ship on terracotta amulet (length 4·5 cm.)
C (*below*) Lothal: general view of Harappan dockyard. The main settlement lies on the left, and the spillway can be seen in the left foreground

13 Mohenjo-daro: seals with animal motifs. 1, Indian humped bull; 2, Indian elephant; 3, water buffalo with feeding trough; 4, pair of antelope; 5, bull of primogenius type with manger; 6 Indian rhinoceros; 7, mountain goat



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18 a (right) Seal of 'Persian Gulf' type from Lothal (diameter 2·3 cm.)
b (centre) Lothal: burial and double burial of Harappan period
c (below) Mohenjo-daro: terracotta cart







19 Lothal: painted pottery of Harappan period









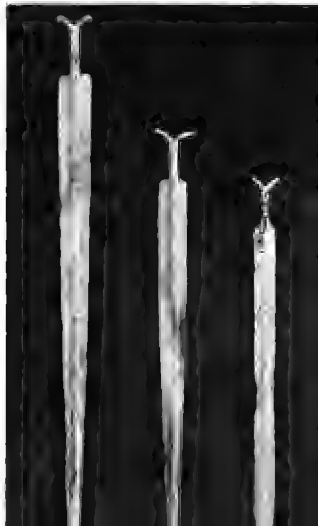


OPPOSITE:

40 A (*above*) Mohenjo-daro: female figurines of terracotta
B (*below*) Jewelry of gold, faience and semi-precious stones from Mohenjo-daro

41 A (*above*) Hoard of copper objects, Khurdi, Nagaur district, Rajasthan
B (*below*) Bronze swords with antennae hilts, discovered near Kallur, Raichur district (approx. [illegible] of actual size)





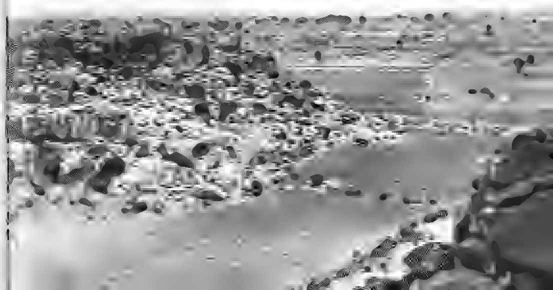




22 A (*above*) Bone and antler tools from Burzahom, Kashmir
B (*below*) Ground and pecked stone tools from Burzahom. 1, 4, 6 and 7, ground and pecked stone axes; 2, rectangular harvesting knife with pierced holes; 3, hammer stone; 5 ring stone

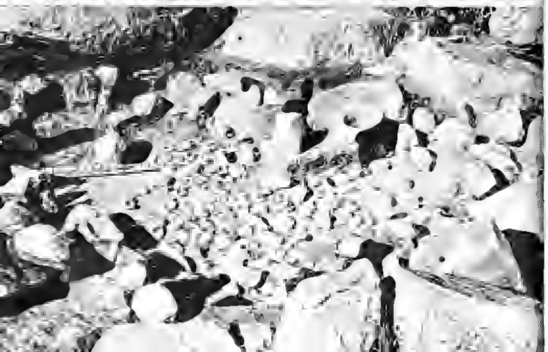
OPPOSITE
23 A (*above*) Neolithic burial from phase II, Tekkalakota
B (*below*) A typical Neolithic hill settlement in northern Mysore, Piklihal, Raichur district





24 A (*above*) Modern Bura hut in Tekkalakota village
B (*below*) Excavation of Neolithic hut floor in hill settlement above Tekkalakota village





25 A (*above*) Piklihal, terracottas from Neolithic period
B (*below*) Palimpsest of rock bruised bulls, Maski

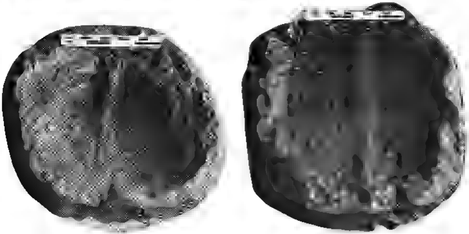




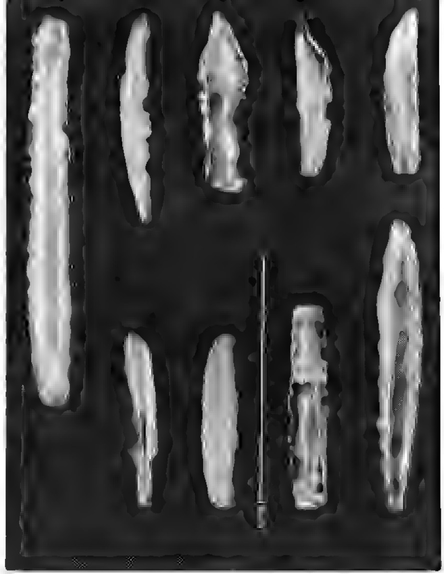
26 1 (*above*) Hoof impressions from floor of cattle-pen in ash-mound
2 (*below*) Excavation of ash-mound at Utnur, Mahbubnagar district

OPPOSITE

27 1 (*above*) Chalcolithic blade industry made from chalcedony, from Chandoli, Poona district
2 (*below*) Channel-spouted bowl from period IIID, Navdatoli

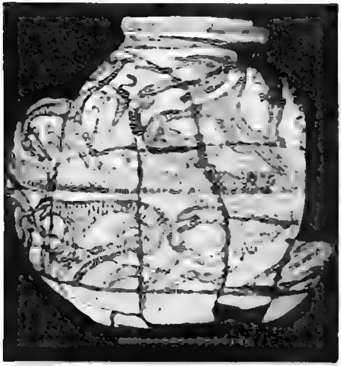




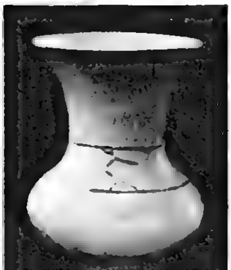




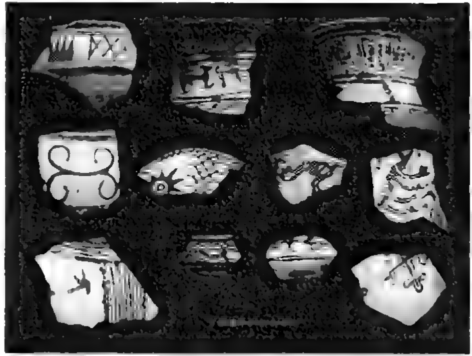
28 A (*above*) Painted pot of Malwa ware, Daimabad, Ahmadnagar district
B (*below left*) Navdatoli high-necked vessel from Chalcolithic level
C (*below right*) Water pot of Jorwe ware, Navdatoli

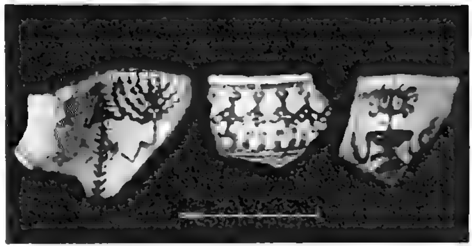






29 A (*above*) Painted pottery of Malwa and white slipped wares from Navdatoli, period III
B (*below*) Painted Malwa ware from same site, period III





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32 a (*above*) Iron Age cist graves from Brahmagiri, Mysore, showing port-hole and grave goods
b (*below*) Iron Age pit burial from Maski, Raichur district, with grave goods and extended skeleton





THE SOUTHERN GROUP

The presence of very large numbers of ground stone axes in the Karnatak region, in the valley of the river Krishna and its tributaries, was first established by Bruce Foote. Largely on account of the foundation provided by his researches, it has now become the best documented of the Neolithic groups we are considering. Since 1947, when Sir Mortimer Wheeler excavated at Brahmagiri, there have been excavations at several settlements, such as Sanganakallu (1948, 1964–5), Piklihal (1951), Maski (1954), Tekkalakota (1963–4), and Hallur (1965). In addition 'ash-mounds' at Utnur (1957) and Kupgal (1965) have been excavated and shown to be Neolithic cattle-pens. At present radiocarbon dates are available for no less than five sites in this area. The southern extension of the culture is represented by the site excavated at T. Narsipur at the confluence of Kaveri and Kapila rivers, and the neighbouring Hemmige near Mysore; the eastern, towards the coast, by the excavations at Nagarjunakonda and at Paiyampalli in North Arcot district. It is possible, on the basis of comparisons, to provide some sort of tentative sequence for the periods which precede the introduction of iron at these sites:

1. The earliest settlements were made by a people who possessed a ground stone-axe industry and a somewhat rudimentary flake or blade tradition. It is evident that they had domesticated cattle, sheep and goats. Their pottery was predominantly handmade grey or buff-brown, but a less common ware had a black or red burnished slip, often with purple-painted decoration. A feature of the grey ware was the use of bands of red ochre applied after firing. Other noteworthy features of this early pottery are the applied ring feet and hollow pedestals, recalling those of pre-Harappan Amri or Kalibangan. The settlements were usually made on the tops of granite hills, or on levelled terraces on the hillsides, or on saddles or plateaus between two or more such hills (Plate 23 B). They also made forest cattle stations, probably for seasonal grazing (Plate 26 B). Terracotta figurines are predominantly those of humped cattle (Plate 25 A), and rock paintings and rock bruisings around the settlements are also

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to the north. The third phase shows even stronger external influences; in particular we note the intrusive 'Jorwe' type pottery, and the copper and bronze objects with Jorwe or even post-Harappan affinities (fish-hooks, double axes, etc.). The hypothesis has been advanced that this Southern Neolithic originates as a result of movements of people and cultures into the subcontinent from the east. The evidence is not sufficient to warrant either complete confirmation or rejection of this, but if it is to be maintained it must be in the face of the several more positive indications of north-western connexions we have outlined above.

THE EASTERN AND OTHER GROUPS

From the hill areas of Assam come many further surface collections of stone axes. These have been treated typologically, for so far only one very small excavation has been made, and this does not reveal any clear sequence, or any dates. So far as surface collections go, there appear to be certain broad divisions. Thus from the Garo Hills some sites produce almost nothing but flaked, or flaked and edge-ground axes of unspecialized triangulate form. Examples of such collections are from Ronchigiri and Rongram. The one excavation to which we referred was at an open site, Daojali Hading in the North Cachar Hills. It was carried out by Dr T. C. Sharma and members of the University of Gauhati. It is not clear whether the finds were *in situ* or redeposited, but the rich deposit included large numbers of stone axes, bones, and quantities of sherds of cord-impressed and striated beater-impressed pottery. Among the stone tools were large numbers of small ground axes of rounded form, and numbers of small shouldered adzes with angular outline (see Figure 39). Both these are types not encountered in the Northern or Southern groups. They are types which have an extensive distribution in China and South-east Asia and a long and respectable ancestry there. So too has the pottery, in so far as it can be identified. Its affinities seem to be with south China, recalling the pottery of the Neolithic sites around Hongkong. No metal was encountered in the excavation.

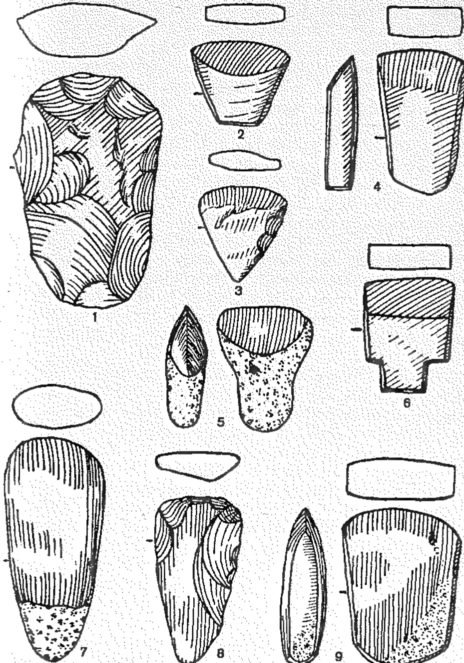


Figure 39. Stone axes from Assam. 1:3

1, North-East Frontier Agency; 2, 3 and 6, Cachar hills; 4 and 8, Garo hills; 5, 7 and 9, Naga hills.

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Desalpar IA, in Cutch. It will be interesting as research advances to see whether it is possible to differentiate Harappan settlements such as Lothal from other sites, and whether the local cultural elements predominate at some sites more than others. One would like to know, for example, whether Harappan seals or sealings are found at the smaller sites. From what is already published it appears that, if not seals, at least inscribed potsherds are noticed at Rangpur and Rojdi.

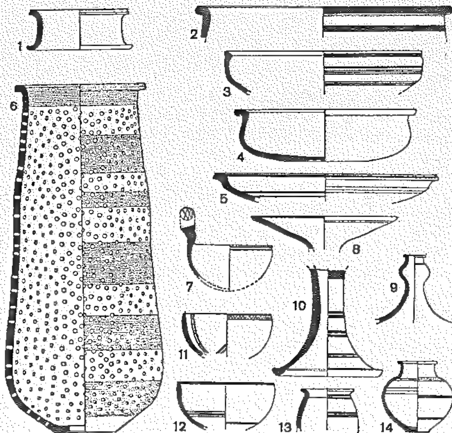


Figure 43. Rangpur IIA, red ware pottery. 1:6

2. Post-Harappan. This phase is represented by Lothal II, Rojdi IB, Rangpur IIB, and by the earliest settlement at Somnath (Prabhas Patan) IA. At both Lothal and Rangpur it is marked by a decline, following no doubt the withdrawal of Harappan trade and influence. The pottery and other items of material culture continue without any marked break, but

elaborate town-planning and drainage, so characteristic of Harappan culture, disappear. This period should commence around 1800 B.C., and at Rangpur the occupation is of about 12 feet in depth. A radiocarbon date for this period from Rojdi gives 1745 B.C.

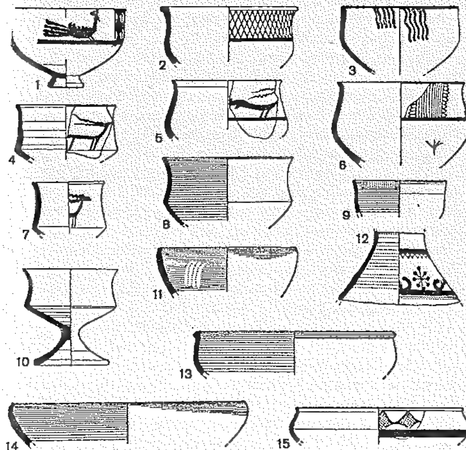


Figure 44. Rangpur pottery. 1:6

Period IIB: red ware, 1. Period IIC: red and lustrous red wares, 2, 3 and 5–7. Period III: red and lustrous red wares, 4, 10, 12 and 15; black-and-red ware, 8, 13 and 14; white-painted black-and-red ware, 9 and 11.

3. The third period coincided at Rangpur IIC with something of a revival. This may be equated with Rojdi IC and Somnath IB. Again there is no real break with the preceding period. Some further distinctive Harappan forms of pottery, such as the footed goblets and the terracotta cakes disappear, and new painted motifs are found on the pottery, including

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on the Narbada river itself, excavations have revealed Chalcolithic settlements below those of a later period; and in both cases the material culture suggests an expansion of that of Malwa. A series of radiocarbon dates from Eran have recently been published, but they do not seem to bear a uniform relationship to their reported stratified provenances. The indication they provide is that the Chalcolithic culture at this site extended from *c.* 1500 to 1280 B.C., and probably gave way to the Iron Age around 1040 B.C. but the published evidence from both these sites at the moment is too slight to present a very definite picture. There is a suggestion at Eran that the final phase of the Chalcolithic (IIA) may be associated with black-and-red ware; this phase appears to date between about 1270 and 1040 B.C.

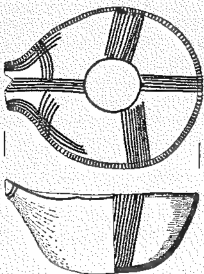


Figure 54. Patpad, painted channel-spouted bowl 1 : 8

The sparse evidence from parts of eastern India of the farthest limits of this post-Harappan Chalcolithic spread can be briefly put forward. At Pandu Rajar Dhibi in the Burdwan district of West Bengal the excavation of a mound has produced a culture sequence with two pre-iron periods, characterized by a stone-blade industry, apparently of debased form, ground stone axes, and a number of copper objects including fish-hooks. The pottery included painted red ware and black-and-red ware, and channel-spouted bowls are of common occurrence. Taking this assemblage as a whole, we would expect it to belong to something equivalent to the Jorwe phase at earliest, but more probably slightly later than that phase in the west. A single radiocarbon sample gives a date of 1012 ± 120 B.C. and seems plausible. At Mahisadal in the adjacent Birbhum district another recent excavation has yielded con-

firmation of this sequence. Period I was Chalcolithic, with simple huts of plastered reed. The finds included a typical blade industry and a flat copper celt; pottery included black-and-red ware, sometimes white painted, and red ware, some with black-painted decoration. The forms of pottery recall those of Pandu Rajar Dhibi, channel spouts being prominent. A quantity of charred rice was discovered. This period is dated by three C14 samples to between 1380 and 855 B.C. The succeeding period II saw a continuation of the now somewhat coarser pottery and the arrival of iron, and a single radiocarbon sample suggests that this event took place before 690 B.C.

Far to the south, in the Kurnool district of Andhra Pradesh, a large group of sites, first identified by Bruce Foote, produces a distinctive painted red ware which we may name after the type site, Patpad ware. The culture which produced this pottery at Patpad (Pattupadu) and elsewhere flourished within a few scores of miles of the sites of the Karnataka region, and yet it shows a remarkable difference in the style of painting, and in other details. The channel-spouted bowl is here again a special feature. While evidence of the age of this culture is even less clear than in the case of Bengal, we are inclined to assign it to a somewhat similar chronological horizon. Another site of perhaps about the same age is reported to have been excavated in 1961 at Kesarapalli in the Krishna district, revealing a considerable deposit of late pre-iron materials. Yet farther south in Pondicherry, Casal discovered and excavated a number of urn burials at Gaurimedu and Mangalam. The predominant red pottery associated with them, the pot forms, and the absence of any metal objects other than copper or bronze, all indicate that these belong to a cultural phase anterior to the Iron Age. There is of course no inherent improbability that further, earlier stages of Chalcolithic or Neolithic settlement may be found in all these eastern areas, but in our view those so far reported are more likely to belong to a late Chalcolithic phase chronologically akin to the Jorwe phase of Maharashtra.

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number of sites have yielded occupation in their lower levels which may be assigned to the Iron Age. Thus at Broach and Nagal, on the north and south of the Narbada estuary respectively, and at Nagara, the old Cambay, excavations have revealed a period of black-and-red ware preceding the importation of sherds of N.B.P. The black-and-red ware at Nagal often bears scratched graffiti or decoration, suggesting its earliness, and a stone-blade industry was found in association. Iron came from all levels except the lowest; while bone arrowheads and points, and beads of carnelian and semi-precious stones were found throughout.

The picture from Malwa and the Central Indian sites is slightly clearer. At Nagda period II appears to have been a direct continuation of the earlier settlement; it produced black-and-red ware, some iron objects, and a continuation of the blade industry. At the neighbouring Ujjain, period I produced black-and-red and plain red ware. At both these sites a considerable depth of occupation ensued before the importation of stray pieces of N.B.P. The Ujjain I assemblage is reported to have included a sherd of Painted Grey ware, along with the more common pottery. Iron arrow- and spearheads and bone arrow-heads were also found. As period II can be reasonably associated with the Mauryan occupation, its forerunner may well extend back to *c.* 600 B.C. The latest recorded radiocarbon dates for the Chalcolithic periods at Navdatoli and Eran are 1440 and 1280 respectively, but as a whole sub-period of the Chalcolithic, IIID, follows at the former site this date has only indirect bearing. At Eran, period IIA coincides with the appearance of black-and-red ware, a copper object is reported, but it is not clear if iron occurs. The period is dated by a radiocarbon sample, said to derive from its commencement, to 1040 B.C. It is noteworthy that at Eran as at Kausambi, the excavator claims that the fortifications were anterior even to the Iron Age, going back to the Chalcolithic period.

Farther east, on the western fringes of the Ganges delta there is every sign that iron working spread to the existing areas of Chalcolithic settlement at an early date. Thus at Mahisadal period II commences before 700 B.C. The main elements of the material culture continue from the previous period, suggesting that the arrival of iron involved no profound change in population. The pottery becomes somewhat coarser and is augmented by a grey or buff ware. Iron appears to have been plentiful and quantities of slag occurred. Whether this culture had closer links with the Central Ganges region, or with settlements in the forests to the south of the Ganges, has yet to be seen and must await further publication. The radiocarbon date is certainly close to that of Chirand IB.

PENINSULAR INDIA

Turning southward into Maharashtra the situation is no more definite. Nevasa and Chandoli provide convincing dates of 1250 and 1042 B.C. respectively for the continuation of the Chalcolithic; and at several sites there appears to be continuous occupation through into the Iron Age. There is still, however, a perplexing absence of radiocarbon dates relating to early Iron Age levels. At Prakash in the Tapi valley, there was a short hiatus before Period II. This latter was represented by some fourteen to fifteen feet of black-and-red ware deposits below the first occurrence of N.B.P. and therefore testifies to a fairly protracted occupation. Iron appears at the beginning of the period and continues alongside the black-and-red ware. Among iron tools we may note the flat celt-like axes, recalling the forms of copper axes of Harappan and post-Harappan times; shaft-hole axes appear at Prakash only in the subsequent period. Although the duration of the period must have been considerable, there is little apparent indication of any significant changes in the material culture throughout. At Bahal, period II produced similar evidence. At Tekwada on the opposite bank of the Girna river an important related burial site was discovered. Here M. N. Deshpande excavated three urn burials and one pit burial. The burial-pit had a floor lined with stone slabs. The pottery from these burials is a compound of elements belonging to the Jorwe phase and elements of the earliest phase of the Iron Age. Hence we are inclined to assign them to the transitional period heralding the arrival of iron. No iron was discovered, but the black-and-red ware was in some cases marked or rather scratched with owners' marks. These

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research is called for before this can be achieved. The excavations hitherto have not been very helpful, in terms of purely stratigraphic differentiation.

At Brahmagiri, Maski and Piklihal, the period is followed by one in which a distinctive white-painted black-and-red or plain red ware with russet dressing (the 'Russet coated' or 'Andhra' ware) appears. With it are tray bowls recalling north Indian forms appearing in the N.B.P. ware, but bearing a rouletted pattern on the inside of the base. From the coincidence of this ware on the Tamil coast at Arikamedu with Roman imports, including inscribed or stamped sherds of Arretine ware, the commencement of the period as a whole cannot be much earlier than the opening of the Christian era. However, the rouletted ware pre-dated the Arretine at Arikamedu, and there is a likelihood that in the western parts of the peninsula it may be found to occur at a somewhat earlier date. As the principal form of the rouletted ware is the tray-bowl characteristic of the Ganges valley, and as this form more or less disappears from pottery in the north before the opening of the Christian era, some considerable revision of chronology may be necessary when further evidence comes to light.

The sequence of the eastern coastal plain or Tamilnad is revealed by the excavations of Wheeler and Casal at Arikamedu, and the more recent excavations at Kunnattur, Alagarai and Tirukkambuliyur in Trichinopoly district. At all these sites, a period coinciding with Roman trade imports and producing a predominantly red pottery is preceded by one in which the characteristic pottery is black-and-red, similar to that of the graves. It is obviously of great interest to discover how this sequence relates to the introduction of such elements as writing, and to the flowering of the early south Indian civilization which finds its echoes in the poetry of the 'Sangam' period. In this region, as in Karnataka, there are indications of several sequential phases of the Iron Age, although as yet excavation has scarcely demonstrated this. For example, from T. Kalluppatti, about thirty miles west-south-west of Madurai, a surface collection has been made of fine white-painted black-and-red ware of a kind which may well date from the very beginnings of the Iron Age and indicate a rapid movement from far to the north-

west in Malwa or beyond. Certainly it demands comparison with that from Hallur in Karnataka. This type of painted decoration is comparatively rare at present. The russet dressed and painted black-and-red ware, from Coimbatore, Jadigenahalli, Tirukkambuliyur, etc., probably indicates a late phase of the Iron Age, coinciding with the centuries around the turn of the Christian era and also echoing the third phase of Karnataka.

BURIAL COMPLEX OF THE SOUTH INDIAN IRON AGE

From the preceding paragraphs it will have seemed that the Iron Age of the southern peninsula is in some respects curiously neglected, and indeed little understood. But there is another large body of evidence relating to it, which derives from the great complex of Iron Age burials, frequently known as 'megaliths'. The term has been rather widely interpreted and has on occasion been used for urn burials lacking the presence of small, let alone great stones! We have associated an important change from burial among the settlements to burial in separate graveyards with the first appearance of iron in the south. The subsequent centuries saw an enormous proliferation of varied practices of disposing of the dead, and as modern observation has revealed a corresponding variety still in vogue in south India, it seems reasonable to infer that the burial complex has continued as a part of south Indian culture for a very long period.

The distribution of these Iron Age graves is far wider than any one culture region: they are reported in great numbers from the extreme south and coastal Ceylon, throughout most parts of the peninsula in which granites and gneisses are the predominant rocks, and as far north as Khandesh and Nagpur. A few isolated sites from the hills south of the Ganges valley (such as Kotia in Allahabad district) may also be regarded as outliers both in time and space.

Among the graves certain main types regularly recur, of which we note the following:

(*a*) Large urns, often piriform, containing collected bones previously excarnated, and buried in a small pit, marked in

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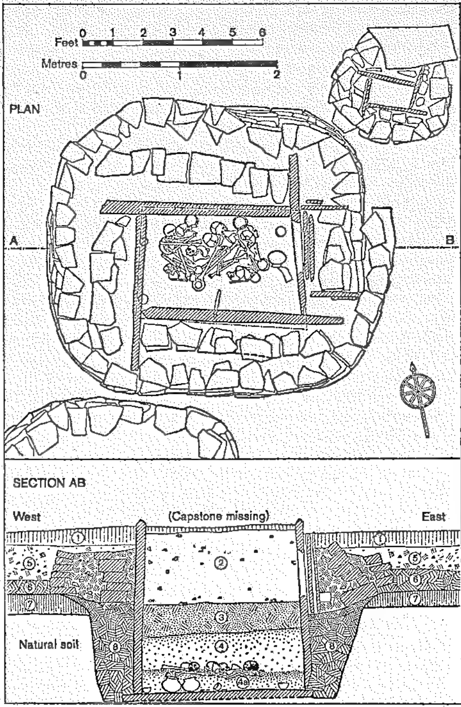


Figure 63. Brahmagiri, plan and section of stone cist grave

Among them a few outstanding examples may be mentioned: between 1851 and 1862 Colonel Meadows Taylor published accounts of his excavations in Shorapur; Alexander Rea between 1899 and 1904 excavated many urn burials at Adichanallur in Tinnevelly district (Plate 30 B); in 1916 and 1924 Dr Hunt published accounts of graves he had excavated at Raigir and Bhongir, east of Hyderabad. Since 1945 several sites have been excavated including Brahmagiri, Sanurin Chingleput district, Porkalam in Trichur district, and many graves around Nagarjunakonda and Yelleshwaram, Maski, Jadigenahalli in Mysore, Souttoukeny and Mouttrapaleon in Pondicherry.

Although there is a wide diversity of burial customs, other factors give this whole series a general uniformity. In all the graves pottery, and particularly black-and-red ware, is found, often in quantity (Plate 32 B). In almost every excavated grave some objects of iron, of surprisingly uniform types, occur (Figure 64). The pottery from the graves is patently that of the Iron Age levels in the settlements, although certain special forms are found in the graves. Distinctive types include a shallow tray-bowl and a deeper bowl, both with a rounded base, conical lids with knobs or loops on the apex, pottery ring stands, larger waterpots, invariably with rounded bases, and so on (Figure 61). Other commonly found grave goods include etched carnelian and other beads, small gold ornaments, and occasional objects of copper, bronze or stone. But iron is almost universal, and the range of identical tool types, repeated many times, at sites as far apart as Nagpur and Adichanallur – that is to say some 900 miles apart – must testify to the diffusion of a fairly tightly knit group of iron-workers. Among the most common tools are flat iron axes often with crossed iron bands for hafting. The shaft-hole axe, which appears at a very early date in north India and spreads to south India during the first millennium A.D. to become today almost the universal axe type, is unknown in the Iron Age graves of south India. A second common type includes varieties of flanged spade, hoe, spud or pick axe, and a third includes sickles or bill-hooks. Iron wedges and crowbars, or perhaps spears, of up to seven feet in length are found. A variety of knives, chisels or adzes, iron tripods or pot rests, saucer hook-lamps and many-armed lamp-pendants,

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subcontinent distinct cultural groups at very different levels are to be found living in more or less close proximity to one another. The inhibitions and the stimuli provided by the interrelationship of these groups are factors which the archaeologist can never afford to lose sight of and to which we must return again and again.

As we have pointed out in an earlier chapter, with the exception of Sanghao in the former North West Frontier Province, no settlement of the Early or Middle Stone Age is known in the Indian subcontinent. A few factory sites such as Kondapur in the Deccan, or some of those in the Narbada valley in Central India, for example, the frequent occurrence of stone tools in gravels of most of the major rivers, and their remarkable absence from cave deposits, all indicate a nomadic life in the open, centring upon the banks of the great rivers and the better-watered parts of the country. The considerable size of certain of these Middle Stone Age factory sites suggests continuity of population and local tradition over a considerable period of time, as indeed does the material from Sanghao. With the Late Stone Age the number and variety of sites, particularly in some regions, greatly increases. Wherever they occur they include small open-air sites, almost always on the summits of hills or ridges, at which a fairly representative range of tools is usually found. The same sort of position is frequently chosen for their rather impermanent settlements by modern aboriginal peoples such as the Chenchu of south-eastern India and various groups in Central India. Here a family or a small group of families build their huts with low walls of wattle and daub and roofs thatched with palm leaves. They may spend the greater part of the year there, or only a few weeks or months, and occasionally move the huts to a different position. When this happens, few traces of the settlement remain, except for any indestructible oddments they may have dropped. Late Stone Age sites of this kind therefore would appear to represent temporary living places where huts or shelters of a rather flimsy nature were probably built.

Frequently one also comes across a small scatter of Late Stone Age tools on the surface of the ground, which include only a limited range of tool types. In these cases it seems likely that a certain piece of work such as cutting down a tree, making wooden tools or vessels, or skinning and disembowelling an animal was carried out there. This situation is clearly demonstrated by ethnographic accounts of hunting people using stone tools in regions as far apart as South Africa and Australia. Large factory sites of the Late Stone Age are also found in certain regions, notably in Central India, North Mysore and Ceylon, and like corresponding sites of the Middle Stone Age suggest continuity of local tradition. It is highly probable that huts were erected at these larger factory sites. Post-holes noticed at Birbhanpur in the extreme eastern extension of the Central Indian hills strongly suggest this, and so does a quantity of charcoal found by the excavators at Bandarawela in Ceylon. The charcoal may however have resulted from fires used to heat pieces of quartz before shattering them, in the process of making tools. Tools of the same Late Stone Age industrial tradition, but varying somewhat in the range and relative proportion of the different types, are found at all open-air sites and also in caves and rock shelters where these occur.

Apparently it was only with the Late Stone Age that people began to inhabit caves and rock shelters regularly (Plate 1). We have very few records of tribal people living in caves for any length of time in India or Pakistan, although herd boys may shelter or even camp in them, and religious mendicants or Sadhus sometimes establish themselves in them for many years together. In Ceylon early in this century the Veddas are described as living in caves during the wet season, and erecting screens of sticks and animal skins as additional protection from the weather. This probably provides an analogy for Late Stone Age practice elsewhere in the subcontinent. Clearly we have here the material for a study of settlement patterns in the Late Stone Age, such as we have tentatively suggested in the case of the Late Stone Age sites of West and Central India or Ceylon in an earlier chapter.

At any stage the essential features of a living site are its proximity to water, and to land suitable for hunting, agriculture, or other essential activities. At different periods other factors, such as a view of the surrounding countryside, freedom from insects, accessibility, defence and communications may take on

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dwellings of the pre-Harappan phase in the Indus Valley and Punjab, far more information is available concerning the civilization which succeeded them. The basic geographical determinants remained constant, and therefore in almost every case the earlier sites remained in occupation. But there must also have been a great increase in population and as a result not only did the size of settlements increase, but many new sites were founded. We have already remarked upon the extraordinary uniformity of culture found at all the Harappan sites, and this uniformity permits us to infer from the larger and better-known sites the common features of architecture and planning of the smaller and less well known. We have also noticed something of the relationship of the cities to towns, trading-posts or ports, and smaller settlements. Unfortunately very little attention has hitherto been paid to the last category, and much remains to be learnt of the village communities which may be expected to have formed the basis of the Harappan system. Indeed at the present moment we have no idea how much of the population was centred upon the cities and how much was dispersed through villages. Harappan uniformity begins with the basic conception of the city plan (Figure 66). At Harappa, Mohenjo-daro and Kalibangan this consists of two distinct elements: on the west a 'citadel' mound built on a high podium of mud brick, with a long axis running north–south, and to the east – apparently broadly centred upon the citadel – a 'lower city', consisting of what must have been the main residential areas. The citadel certainly, and probably also the lower town, was further surrounded by a massive brick wall. The principal streets at best were laid out with controlled skill (although at Mohenjo-daro they are not in precise alignment), and the widest streets appear to have run across the lower city from north to south. At Kalibangan the roads on the east–west axis only partly run across the whole town, some being staggered from block to block; and the same feature, at least in part, is repeated at Mohenjo-daro (Plate 10 A and Figure 70). There appears too to have been a general coordination of measurements of the streets, the largest being twice the width of the smaller, and three or four times that of the side lanes. Within the blocks thus formed were the dwellings of the general popu-

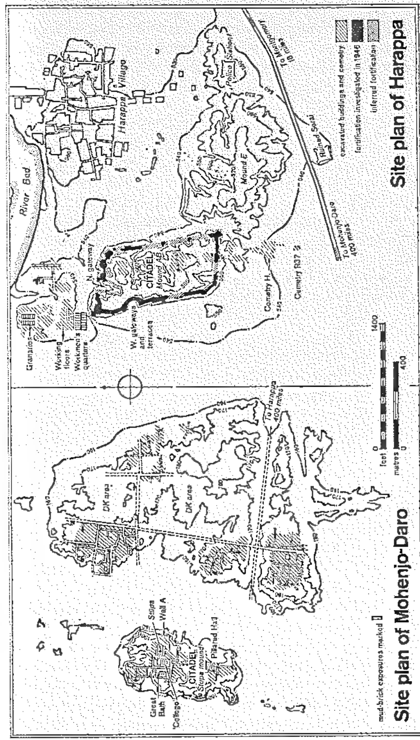


Figure 66. Outline plans of Indus Valley cities

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for wells, drains and bathrooms. The predominant brick size was 11 by 5·5 by 2·75 inches, that is a ratio of 4:2:1. The bricks were mainly made in an open mould, but for special purposes, such as bathrooms, sawn bricks were invariably used, and wells were constructed with wedge-shaped moulded bricks. The flooring of houses was either beaten earth, or sun-dried or burnt-brick. In some bathrooms a sort of plaster of brick dust and lime was reported. Worked stone was rarely employed structurally, and the true arch was not used, but the corbelled arch in brick is frequent. Certain pieces of worked stone suggest segments of pillars, but it is not clear whether these were ever employed structurally. Timber was used for the universal flat roofs, and in some cases the sockets indicate square-cut beams with spans of as much as 14 feet. In certain rare instances timber also seems to have formed a semi-structural frame or lacing for brickwork.

Considerable variation is seen in the size of dwellings, which range from single-roomed tenements to houses with courtyards and upward of a dozen rooms of varying sizes, and to great houses with several dozen rooms and several courtyards. Nearly all the larger houses had private wells. In very many cases brick stairways led up to what must have been upper storeys or flat roofs. Hearths are commonly found in the rooms. Almost every house had a bathroom, and in some cases there is evidence of bathrooms on the first floor. The bathroom is indicated by a fine sawn brick pavement, often with surrounding curb, and its connexion by a drainage channel to chutes built in the thickness of the wall, giving access to the main street drains. A number of pottery drainpipes were also found. Mackay has shown that many of the smaller examples of these fine brick pavements in fact represented privies, and that the chutes for these are vertical as against the sloping chutes of the baths.

The entrances to the houses were from the narrow lanes which were set at right-angles to the main streets. A distinctive feature of the construction was thus that the roadward side of a block presented a plain blank façade broken only where drainage chutes discharged. The houses seem often to have been built with an oblong perimeter wall, and adjacent houses

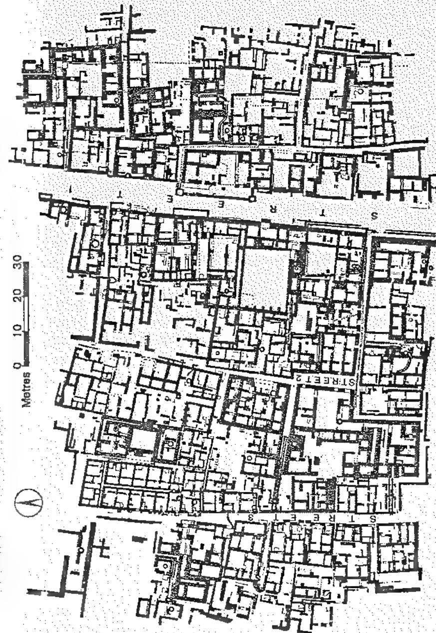


Figure 68. Mohenjo-daro, plan of part of lower city

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daro, based upon comparison with the population of a city of comparable area in Sind in 1841. As Harappa appears to have been of roughly equivalent size, its population may well have been more or less the same.

Turning to the buildings of the citadel mounds, or their vicinity, we encounter a series of remarkable structures of a very different character. Their special nature is emphasized by the great podiums of brick or mud-brick and earth filling upon which they stood. The floods which at Mohenjo-daro devastated the lower city several times probably provide the *raison d'être* for the citadel mounds. The great brick embankment, some 43 feet in height, which ran round the platform at Mohenjo-daro must also have served the same purpose, and is no doubt the counterpart of the massive defensive wall which surrounded the Harappan citadel.

Perhaps the most remarkable feature of the citadel mound at Mohenjo-daro is the Great Bath (Plate 11). This finely built brick structure measures 39 feet by 23 feet, and is 8 feet deep from the surrounding pavement. It is approached at either end by flights of steps, originally finished with timber heads set in bitumen. The floor of the bath was constructed of sawn bricks set on edge in gypsum mortar, with a layer of bitumen sealer sandwiched between the inner and outer brick skins. Water was evidently supplied by a large well in an adjacent room, and an outlet from one corner of the bath led to a high corbelled drain disgorging on the west side of the mound. Surrounding the bath were porticos and sets of rooms, while a stairway led to an upper storey. The significance of this extraordinary structure can only be guessed. It has been generally agreed that it must be linked with some sort of ritual bathing such as has played so important a part in later Indian life, and therefore that it must mean that this part of the citadel was connected with the civic–religious life

Immediately to the west of the bath excavation has revealed an equally remarkable group of twenty-seven blocks of brickwork criss-crossed by narrow ventilation channels. Sir Mortimer Wheeler has shown that this structure is the podium of a great granary (akin to that of Harappa, although of somewhat different design), and that below the granary were the brick

loading-bays from which corn was raised into the citadel for storage. Therefore this too is a building of civic importance. Around the bath on the north and east were other large blocks of buildings which may be inferred to be associated with the group of administrators (perhaps priests) who controlled not only the city but the great empire which it dominated. Further excavation on the south of the citadel mound may corroborate this view. Here an oblong assembly hall was unearthed having four rows of five brick plinths upon which no doubt wooden columns were erected. The floor between these plinths was of finely sawn brickwork, recalling that of the bath. In the complex of rooms immediately to the west another seated male statue in stone was discovered, and near by a number of large worked stone rings, possibly pieces of architectural masonry but more probably part of a stone ritual column. These finds recall those supposedly associated with a temple in the lower city, and almost certainly indicate the presence of a temple in this part of the citadel.

The citadel mound at Harappa is comparatively much less well known, both because it has been less excavated, and because it is more disturbed by subsequent occupation and depredation. But immediately to the north, between it and the old river bank lies an area of ground of comparable interest to the citadel at Mohenjo-daro. Here was another series of brick platforms which constituted the basis for two rows of six granaries, each 50 by 20 feet, lying within a few yards of the river's edge. The combined floor space of the twelve units must have been something over 9,000 square feet, approximately the same area as that of Mohenjo-daro. To the south of the granaries was an area of working floors consisting of rows of circular brick platforms, evidently for threshing grain: wheat and barley chaff were found in the crevices of the floors. Immediately below the walls of the citadel were two rows of single-roomed barracks, recalling the smallest dwellings in the lower city at Mohenjo-daro and artisans' or slaves' quarters in such sites as Tel-el-Amarna in Egypt.

The smaller citadel mound at Kalibangan has not yet been fully excavated, but it shows a number of corresponding features. In the southern part are brick platforms, probably for

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cow-dung plaster. Hearths, sometimes associated with tripods of small upright slabs of granite, were found either within the house or near by, and so too were grinding stones, some with mullers still in position. A large pot, buried up to the neck, probably served as a storage jar. In the later 'Chalcolithic' phase which covers the transition from the Neolithic to the Iron Age, walls of more massive boulders were built. In many parts of southern India circular huts are still in use among the poorest strata of society and their construction, furniture and utilization, can scarcely have changed since Neolithic times. At Tekkalakota Dr Nagaraja Rao found several such huts in the modern village at the foot of the hill on which the Neolithic inhabitants first constructed their dwellings some 4,000 years earlier (Plate 24 A). In our excavations at Piklihal fragments of the clay moulding of door frames were discovered in the excavations which were identical with those of huts in the modern village of Mudgal. Even though the settlement as a whole covered a large area, these scattered groups of huts on hill terraces cannot, we believe, have housed a very large population, and certainly its numbers cannot be estimated with reference to modern settlements in the same region in the way that they may be in Sind or Baluchistan.

Another feature of this area during the Neolithic period was the construction of large cattle-pens with stockades of timber posts. An inner stockade provided the area in which the cattle were herded, while an outer provided a space within which the herdsmen lived. Some of these pens are attached to the permanent settlements, but others are in the forest, remote from any settlement, and they provide evidence for a pattern of the seasonal movements of the herds. So far there is only limited evidence available for the form of these structures, derived from our own excavations at Utnur (Plate 26 B). Here the stockade was burnt and rebuilt several times, each burning being associated with the conflagration of great accumulations of cow-dung. This is what gave rise to the Deccan ash-mounds which for so long mystified archaeologists.

The regions which lie between the Indus Valley and Karnataka offer a series of intermediary styles of house building and settlement. In Saurashtra the influence of Harappan building

construction appears to have persisted. At Rangpur, in the earliest occupation, houses and drains were constructed of both mud-brick and burnt-brick. In the second sub-period huts appear to have consisted mainly of wooden frames which supported some non-durable material such as thatch or matting, but by the end of period II and the beginning of III mud-brick was once again in common use, although floors were still of rammed earth and post-holes, perhaps for the timbers to support the roofs, are found. No complete house-plans are available. At Ahar in southern Rajasthan the picture is rather different. Houses were oblong and often of fair size; one completely excavated measured 30 feet by 15 feet. The walls were of stone and mud, or mud-brick, and perhaps also of wattle and daub. Apparently the roofs were flat, made of bamboo and matting, and covered with earth. No indication is recorded of any development or change during the Chalcolithic occupation at this site.

Going eastwards to Malwa, we encounter at Navdatoli a marked change. Here the huts of the Chalcolithic period were both round and oblong, but all seem to have employed a wooden frame and wattle and daub walls. The floors were made of clay and cow-dung, and sometimes given a lime-plastered surface. The oblong houses were the larger and one measured 40 feet by 20 feet, while the round huts did not exceed 8 feet in diameter, clearly indicative of their subordinate status. The smallest of these round huts must have been used for no more than the storage of grains or other materials. There is no evidence of roof tiles, and the probability is that roofs were thatched. Every house had its own hearth, of a pattern identical to those of Ahar, with three compartments, side by side, made of clay and lime plaster; the store-rooms within the houses contained lines of jars, the larger standing on raised earth stands. The settlements of Maharashtra, as represented in the excavations of Nevasa, Daimabad, Chandoli, etc., appear to have been very similar to those of Malwa. In Malwa and Maharashtra the settlements reflect the geography of the trap regions; they are invariably sited on the edge of rivers or streams, and usually on a high and solid part of the bank. The present evidence therefore suggests that the building styles of

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seems to us worthwhile, if only because it may help to focus attention on the lacunae.

Bearing in mind the climate of the subcontinent and the markedly seasonal nature of even the little rainfall received in most of the areas of early settlement, it comes as no surprise to find that water and its supply are prime determinants of the economy. In much of Baluchistan, Sind and southern Afghanistan the scarcity of water must at all times have set strict limits upon the production of crops, and a pastoral element in the economy has consequently predominated. There are signs that in Baluchistan in prehistoric times attempts were made to retain rainwater in surface drainage tanks, behind earth or stone embankments. There are divergent views upon the age of these so-called 'Gabarbands', but it seems likely that they may belong to the Neolithic–Chalcolithic period. The actual evidence of food grains from pre-Harappan cultures in Baluchistan is still very slender. From Mundigak, period II, come grains of club wheat (*Triticum compactum*), one of the three ancient varieties probably native to this region. The same site produced the Indian jujube (*Zizyphus jujuba* or *ber*). Of animal remains three species are reported at nearly every site so far excavated; they are sheep, goat and cattle. It is not as yet possible to determine from skeletal remains whether the earliest domestic cattle of Baluchistan were of the Indian humped variety (*Bos indicus*), but as both terracotta models and painted pottery figurines depict this variety almost exclusively at a slightly later date, it may be fairly certainly inferred. At Mundigak humped bull figurines occur from period I onwards, and therefore provide the earliest evidence so far for the domestication of *Bos indicus* (Plate 7 A).

There is not much information regarding the pre-Harappan culture-phase in the Indus valley and the Punjab. At Amri the animal remains from period I were largely the same as those of contemporary Baluchistan, with the addition of the ass (?*Equus hydrontinus*). With the Harappan civilization there is suddenly much more information. Wheat is frequently recorded, apparently of two varieties, the club wheat (*Triticum compactum*) and the Indian dwarf wheat (*Triticum sphaerococcum*). Barley (*Hordeum vulgare*), probably of a small-seeded six-rowed

variety, is also found at both Harappa and Mohenjo-daro. Other crops include dates, sessamum, and varieties of leguminous plants, such as field peas. Of particular interest is the discovery at Lothal and at Rangpur (period II A) of rice husks and spikelets embedded in clay and pottery. Their presence in these outlying Harappan contexts, and apparent absence in the Indus valley, calls for a fresh study to be made at the city sites. Another find of great interest was a fragment of woven cotton cloth at Mohenjo-daro. The plant belonged to one of the coarser Indian varieties closely related to *Gossypium arboreum*, and the fibre had been dyed with madder, which is indigenous in India.

The range of domesticated animals, or of wild animals used for food, is quite large. In addition to sheep and goats, there is, as we have seen, repeated evidence of Indian humped cattle. One strain of these is depicted on the Harappan seals (along with a more commonly represented humpless bull of a *Bos primigenius* variety), and is beyond doubt the ancestor of a strain still bred in parts of western India and Sind (Plate 13, No 1). Zeuner has suggested that the zebu may be descended from *Bos namadicus*, a wild cattle which occurs throughout the Indian Pleistocene, and in this case it is probable that the centre of its domestication may have been in South Asia, just as that of *Bos primigenius* was probably in western Asia or Europe. Whether the humpless bull of the seals was actually present in the Indus cities, and if so whether it was imported from the Middle East, are interesting matters which deserve attention. Another species whose bones are of frequent occurrence at more than one site is the Indian boar, *Sus cristatus*, which must have been either domesticated or regularly hunted. The buffalo (*Bos bubalis*) is another such species, but its bones are less common, and at Mohenjo-daro only appeared in the upper levels. Yet more rare are bones of both elephant and camel, but as the former is a fairly common motif upon seals it may be assumed that the Indian elephant was already domesticated. Among birds, bones of the domestic fowl are noteworthy. There is also a range of wild animals which were undoubtedly hunted for food: these include the Sambar deer (*Rusa unicolor*), the spotted deer and the hog deer, and several varieties of tor-

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the Indus valley. Here the ancient crops so far reported include wheat and barley, field peas, lentils and flax. These plants are all found in a wild condition in West Asia and evidence from Jarmo and other Mesopotamian sites would indicate that they were first cultivated there and spread towards India with the early spread of settled life. The southern part of the Deccan plateau forms a second province, in which evidence of cultivation becomes available during the first half of the second millennium B.C. Here a different range of plants was cultivated including the finger millet (*rāgi*), possibly the bulrush millet (*bājrā*), and varieties of pulses such as green gram and horsegram. The two millets would seem to be particularly interesting as both are considered to have been first cultivated in Africa and wild varieties are not known in India. How they were imported is therefore a matter of considerable interest. Between these two provinces lies the intermediate area of the north Deccan and western India. Here we find the earliest evidence so far for the cultivation of rice during Harappan times. Rice appears to be an indigenous crop. Otherwise the region witnesses an expansion of wheat, flax and lentils from the west during post-Harappan times, and shares some of the legumes and millets with the south. Rice seems to have spread into the peninsula at an early date and is recorded from far to the south by early Iron Age times. A fourth region would include the Ganges valley. Here the available evidence indicates that rice cultivation spread eastwards around the close of the second millennium with the advance of settled life. One or two other points deserve mention. It will be seen that there are as yet no finds of the great millet (*javār*, *Sorghum vulgare*) throughout the period. This is in keeping with the evidence of literature that it was not imported until the opening of the Christian era. The earliest evidence for the cultivation of cotton comes from the Indus civilization. Both cotton and rice appear to be indigenous. Finally archaeology can still give no indication of the date at which that other typically Indian crop, sugar cane, was first cultivated.

We must now discuss the evidence – such as it is – relating to economic organization and to trade between groups. We recalled above Childe's dictum of the 'self-sufficing, food-

producing economy' of the Neolithic-Chalcolithic societies. In a strict sense our evidence from the start seems to controvert this view. Already in the earliest stages of settled life in the subcontinent there are suggestions of some sorts of craft specialization and even of trade. For example, it has been observed that in the Southern Neolithic sites there are tools of a distinctive kind of chert which in some cases has been carried upwards of fifty miles from its source. This stone made tools larger and superior to those made from the more locally available river gravels. Again, from the same culture region, a certain distinctive green rock, pistacite, was chosen, among others, for the manufacture of a single tool type, the spheroid hammer or rubber. Tools of this rock, which is by no means common in its occurrence, are found at well over a dozen sites, many miles apart. From this we infer their manufacture at one particular factory, and dissemination among the settlements by a specialist group. Thus there are at least indications that during this period in this region there was a certain degree of internal specialization and hence trade.

There is more evidence, as we shall see, of trade between different culture regions, and in this light we should perhaps qualify Childe's definition of the economy as being 'relatively' self-sufficing. We may recall the suggestion already noticed of trade relations between the settled peoples and their Late Stone Age hunting neighbours, and of its material expression in the trading of stone blades, and following from this the probable exchange of forest produce and other commodities. Throughout central and southern, and indeed all parts of India there are numerous seasonal or annual fairs and markets, frequently linked with religious festivals. These are often held at a temple, or sometimes far from any settlement beside some natural feature such as a hill or a spring. Many scholars have been impressed by their evident antiquity. Whole families will travel many miles in order to attend the largest fairs, and they form important social occasions. Moreover, they frequently serve as cattle markets at which breeders sell their young oxen to the agriculturalists. Such fairs would provide a suitable mechanism for the sort of economic relations between groups which we have postulated, and may well have con-

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empire objects of trade or raw materials derived from the coastal province or from neighbouring territories.

There is plentiful evidence that the Indus merchants or caravan leaders carried their trade far beyond the frontiers of the empire, and established contacts with other peoples, either still in a state of barbarism, or belonging to contemporary civilizations. Of the former we can form some impression by a study of the raw materials imported into Mohenjo-daro. Gold was almost certainly an import, and the presence of clusters of Neolithic settlements contemporary with the Harappan civilization around the goldfields of north Mysore suggests an important source. Silver was imported, probably from Afghanistan or Iran. The sources of copper may have been several, in Rajputana and perhaps south India towards the east, and in Baluchistan and Arabia towards the west. Lead may have been derived from either east or south India. Lapis lazuli, though rare, can only have come from the region of Badakshan in north-east Afghanistan; turquoise from Iran; fuchsite from north Mysore; alabaster could have come from a number of sources both east and west; amethyst probably came from Maharashtra; agates, chalcedonies and carnelians from Saurashtra and west India; jade from Central Asia.

Of trade with other civilized states, notably with the cities of Mesopotamia, there are two kinds of evidence, archaeological and literary. Of the former we may list objects imported from the Indus and exported in return. The most convincing sign of the presence of Indus merchants is the discovery of some two dozen seals, either actually Harappan, or copying Harappan, or of intermediate 'Persian gulf' types, from Susa and the cities of Mesopotamia (see above, pages 139 and 141). Of actual imports, the certain origin is often not easy to determine, but carnelian and etched carnelian beads, shell and bone inlays, including some of the distinctly Indian 'kidney-shape', leave little room for doubt. From the Indus the reciprocal evidence is even less sure: only three cylinder seals of Mesopotamian type from Mohenjo-daro, all probably of Indian workmanship, and a small number of metal objects suggesting Mesopotamian origin. It is probable therefore that the trade included many

objects of less durable kind, cotton, spices, timber, etc. A more definite indication of foreign trade comes from Lothal where a circular button seal of a distinctive kind was discovered (Plate 18 A). This belongs to a class of 'Persian Gulf' seals known otherwise from excavations at the port of Bahrain, and also found occasionally in the cities of Mesopotamia, notably at Ur. The Persian Gulf sites such as Bahrain and Failaka near Kuwait were beyond doubt entrepôts for sea trade between Mesopotamia and outlying regions, and these seals therefore provide very convincing evidence of some sort of trade activities. Also from Lothal come bun-shaped copper ingots, suggestive of a foreign source, and they too may be compared with ingots found on the Persian Gulf islands.

The literary evidence from Mesopotamia helps to fill in the gaps in the archaeological record. It shows that in the time of Sargon of Agade and during the succeeding centuries, merchants particularly from Ur carried on trade with various foreign countries. Among those mentioned most frequently are Tilmun, Magan and Meluhha. The first is now fairly confidently identified with Bahrain and must have served largely as an entrepôt. The second, reputed as a source of copper, has been sometimes identified with Oman or some other part of South Arabia, although the similarity of its name to the modern Makran coast certainly tempts one to locate it in Baluchistan; and the third is now generally identified with India, the region of the Indus river, Mohenjo-daro or Saurashtra. Comparison of the name with the Sanskrit word *mleccha*, barbarian, is suggestive. We learn of Tilmun merchants residing in Ur, and once at least we hear of an official interpreter of the Meluhhan language in the period of the empire of Akkad. We hear also of boats of Meluhha. Among the imports from Meluhha are various kinds of timber, including a black wood identified as ebony, copper of a different quality from that of Oman, gold, a red stone identified as carnelian, of which were made monkey- and kidney-shaped beads, and ivory, of which were made multi-coloured birds and combs. Pearls are often mentioned but their Meluhhan source is not specified. It can be argued that these imports could have originated in Africa, and that the absence of cotton, although this seems to have been

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more regular. Several could be struck from a carefully prepared core. Although some flake tools were no doubt held directly in the hand, as scrapers were in both South Africa and Australia within living memory, others must have been intended for hafting. The reduction in size alone suggests this and so do the tanged flakes recorded in some collections of Middle Stone Age tools. No examples of hafted tools of this period have been found in India, but it is always possible that they may be found preserved in exceptional conditions, as very occasionally objects of a corresponding or even greater antiquity have been found in Europe and Africa. Analogies from prehistoric Europe and sub-Saharan Africa, and from Andamanese and Australian aboriginal usage all suggest that scrapers, knives or missile points might be mounted on wooden handles or shafts with the aid of mastics. Australian aboriginal practice further suggests that many tools normally classified as scrapers may have been used as adze blades, mounted by these means. Resin of various kinds, and lac were no doubt available, and these could be heated once people knew how to manage fire, and worked round the wood to form a base to hold the stone point or edge tool.

Middle Stone Age techniques continued into the Late Stone Age industries of almost every part of India, and especially those of the extreme south and Ceylon. This must indicate a continuity of population. The significant technological developments which we can see in assemblages of stone tools of the Late Stone Age are the methods of making parallel-sided blades, and microlithic tools of various shapes fashioned from these blades and also from small flakes and chips of stone. The method of making parallel-sided blades (see page 79) makes it possible to produce large numbers of blades from a relatively small core of good quality stone in a short space of time. The blades themselves could then be used for various purposes, or converted into the component parts of composite tools. The same component parts could also be made from flakes and chips of stone produced by other methods, which included producing flakes from prepared cores as in Middle Stone Age industries but on a smaller scale, and also by heating suitable pieces of certain kinds of stone and then shattering

them with one or two carefully directed blows. The last method was only applied to quartz, the crystalline nature of which lent itself to shattering in this way. The microliths or component parts produced by all these methods could be used together with mastics and wood to make a whole range of cutting tools and missile points. Some idea of the possible range of variation can be gained from contemporary rock paintings, archaeological finds and ethnographic parallels from many parts of the world (see page 95). The new techniques in stone working must have accompanied technological developments in other fields. It seems most probable that the bow and arrow was one of these, and that improved methods of snaring and trapping, of fishing and perhaps of canoe or boat building, the making of baskets, and mats for shelter, and other crafts were all introduced or developed in the Indian subcontinent as part of the Late Stone Age culture.

The technique of making parallel-sided blades which is so characteristic of the Late Stone Age is also an important feature of the Neolithic and Chalcolithic cultures of certain regions. We have already discussed in the previous chapter the evidence for trade between the Southern Neolithic peoples and the Late Stone Age hunters of the same region, and for trade in stone blades within the Harappan culture. The fine blade industries of the Late Stone Age, Neolithic and Chalcolithic cultures of Karnataka, Maharashtra, western India and the Indus plains are a notable feature (Plate 27 A). Their technical uniformity raises many questions of culture contact both in time and space. The same technique, in a somewhat modified form, has persisted into modern times in the hands of stone bead-makers, who frequently collect their material – semi-precious stones such as agate, carnelian and so on – from the same sources as the Late Stone Age tool-makers. During the Neolithic and Chalcolithic period, an increasing number of semi-precious stones and other materials were used for making beads, an industry which reached its apogee in the cities of the Indus valley. Here several bead-makers' shops and their equipment were excavated. Less than a century ago, the Andaman islanders were recorded as shattering quartz with the aid of fire to make tools, but this method does not appear to have sur-

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decoration, known as Malwa ware (Plate 29). There is some doubt whether this was made on the turntable or thrown on the wheel, as is sometimes claimed. Certainly the major part of it is not wheel-thrown. Distinctive forms of this pottery include chalices with solid stems and feet. There is a remarkable range of painted designs, including those of dancing figures and animals (Plate 28 A). Among the animals are bovines with long wavy horns recalling those of Cemetery H, at Harappa, and Rangpur IIC and III. Another very distinctive form of animal has the body hatched with dots. The slip in many cases has been burnished. A further group of pots is decorated with applied bands, zigzags and even figures. Bowls, both with and without carination are common. Black-and-red ware with white-painted decoration is found. Another fabric is a coarse grey ware, manifestly handmade and probably related to the grey ware of Karnataka. In the second half of the millennium a new pottery, the Jorwe ware, both turntable built, wheel-thrown and with beaten rounded belly, comes into prominence (Figure 51). This has a matt red slip with painted decoration, often in the form of simple linear patterns, far less intricate or time-consuming in the production than those of the Malwa ware (Plate 28 B). The grey wares continue, often with incised or fingertip decoration. The presence of unburnt ochre paint on some grey ware vessels from Daimabad and Prakash again suggests some relationship with the region to the south.

On the whole, all the pre-Iron Age pottery of the regions east of the Indus valley presents regularly recurring features. Among these we may comment on the absence of the foot-wheel and probably of the spun-wheel until relatively late times, the predominance of simple pit or bonfire firing and the variety of ancillary forming techniques, including the turntable, the mould or form, and the use of dabbers and anvils. The dabbers and anvils are exemplified by specimens from excavation in several sites, and represent a potter's technique which diffused throughout the entire subcontinent and continues to dominate its pottery down to the present day.

Of the pottery of the Ganges valley prior to the Iron Age too little is as yet known to discuss its craft aspects. The Painted Grey ware however represents an important stage (Figure 58). Made from fine alluvial clays, its body is uniformly thin and well-fired. There is clear evidence of the use of both the turntable and the spun-wheel, and of the beating of the rounded bellies. Two dominant forms are the shallow carinated bowl, and the deeper, narrower bowl, sometimes with carination. The range of painted design is surprisingly limited. Coarser grey and pink wares occur alongside the fine ware, and a rice husk addition is of common occurrence. Already during this period some vessels have been treated with thick bands of fine black dressing and these provide the forerunners of the Northern Black Polished ware of the following period. The control of firing and temperature throughout bears witness to a more sophisticated kiln than those of the peninsula, and, although archaeological evidence is still wanting, it may be inferred that it involved a separate fire-chamber with a good draught control. The Northern Black Polished ware represents one of the technical high water marks of the Indian potter. It is a black gloss ware with a surface very closely related to that of the Greek Black, but there seems to be no reason to suppose that the Indian potters derived their technique from any external source.

We have dwelt at some length upon the craft aspects of stone- and metal-working and potting, because these cover the most prominent and important categories of archaeological finds. We shall now briefly notice some of the other crafts of the Harappan civilization. In the previous chapter we noticed the discovery of fragments of dyed and woven cotton fabric at Mohenjo-daro. The prehistory of a textile industry is necessarily elusive, as so much of the evidence disappears unless climatic conditions favour its survival. That woven textiles were already common in the Indus civilization, and that the craft for which India has remained famous was already in a mature stage of development, must be inferred from this single find, and from occasional impressions of textiles upon earthenware, pottery and faience from the Harappan sites. A whole class of small vessels of the latter material were evidently formed upon a cloth bag filled with sand or some other suitable substance, leaving the textile impression upon the in-

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There is a strongly abstract flavour running through the whole pre-Harappan range, with geometric patterns preferred to naturalistic or stylized representations of animals or plants.

As it is known at present the painted pottery of the pre-Harappan settlements of the Indus plains shows a range of common elements and a number of distinguishing features. The pottery of Amri most nearly reflects Baluchistan, with a predominance of geometric patterns, but that of Kot Diji and Harappa stands apart with its austere use of plain bands of colours or wavy lines, and very limited use of linear or other motifs (Figures 18 and 19). Very similar decorated pottery is indeed found in Baluchistan, but it is generally overshadowed by more striking forms of decoration. All the more significant therefore are the coincidences of horn (or 'moustache') and flower-petal motifs, between Kot Diji and Kalibangan. The range of painted designs from this latter site is the farthest removed from that of Baluchistan, although some patterns or motifs recall those of Quetta or the Loralai sites. The frequently repeated arch or arcade, often bisected by wavy or diagonal lines, deserves comment, as do the less common flowers, fish, birds and cattle (Plate 8 A). One of the most interesting anticipations of the Harappan style is found in the 'scale' design which appears to evolve throughout the whole region (Figure 20).

The painted pottery of the Harappan civilization is so well known that it needs little comment. Abstract geometric motifs are comparatively rare, the nearest approach being in 'scale', leaf or petal designs. Natural motifs such as birds, fish, animals, plants, trees, and *pīpal* leaves are not infrequent (Figures 27 and 28). Varieties of the 'animal in landscape' style are by no means rare. As with the monotonous repertoire of forms of the Harappan potter, so the painting has a utilitarian quality and a kind of heavy insensibility. On the other hand many pieces show a remarkable delicacy of line and artistic feeling, as for example the pot from Lothal (Plate 19). The pottery of the Cemetery H phase at Harappa shows overwhelming craft continuity with that of the preceding culture (Figure 29). In the same way the painting, with its continuing use of black upon a red ground, may be said to form a logical development rather than a break.

The star and rosette motifs which are characteristic of the Cemetery H pottery are to be found also in Harappan levels, as are the peacock and the humped bull (Figure 75). It cannot be denied however that the often bare vessels with single friezes of decoration, and the extraordinary painted covers with their bird or *pīpal* leaf themes have no counterparts in the Harappan itself, and seem to take their inspiration rather from styles found in Western Iran, for example in Giyan II or Djamshidi II.

Sherds of the early painted ware of the Southern Neolithic pottery are too fragmentary to say much about their design. We see purple paint on a red or brown burnished slip, simple linear patterns, triangles radiating from the neck of the vessel, and wavy lines. Far more interesting is the Malwa ware of Maharashtra and Malwa which shows a wide variety of animal and human motifs, in addition to simple linear designs and geometric patterns (Plate 29). Some of the Malwa patterns are drawn with a fussy, uncertain line. The style is quite distinct from anything in the Indus region, and forms a distinctive stylistic province. Such geometric patterns as are employed are frequently unsurely drawn, and limited to an elementary range, including crossed-hatched panels or bands of square, triangular or lozenge shapes, wavy lines, and loops. Far more prominent is the range of naturalistic motifs. Cattle and antelope are not uncommon, the horns often swept back in wavy lines, recalling those of Cemetery H at Harappa; sometimes registers of indeterminate animals, perhaps felines or panthers, are found; and birds include the peacock. Humans feature mainly as lines of dancing figures with interlinked arms, strikingly reminiscent of rock paintings from both Central India and the Karnataka; but there are also single figures, some with long wavy hair standing on end and some grasping long staffs. A few special motifs, including stars or rosettes, quite elaborate cross patterns, horn patterns, and curious tufted spirals all deserve comment.

The pottery of the succeeding Jorwe phase has two styles: one a continuation of that of Malwa, and the other a new style whose keynote seems to have been speed and deftness of application. The fussiness disappears and the linear patterns are

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ines, both human and animal, were cult objects it is impossible to say; but in later pre-Harappan times the increasing numbers of distinctive female figures, heavily ornamented and with exaggerated features, have been generally seen as mother goddesses, or representations of the Great Mother. So too the increasingly well modelled and often painted figures of bulls may have had some cult significance.

During this period there is already evidence of different burial practices. In the cemetery in mound C at Mundigak, situated outside the main living area, simple inhumations with the body slightly flexed, and generally without grave goods, belong to a date anterior to period III.6. A second group of graves, with communal ossuaries as the common type also dates from this period. The bones had evidently been exposed, or otherwise excarnated, before deposition. In some cases single pots were added as grave goods. A very different picture is provided by the slight evidence from the Kashmir Neolithic settlement at Burzahom. Here burials were among the houses, and in some cases the body had been sprinkled with red ochre. No grave goods were found in the pits, but the skeletons of dogs were buried in the graves with those of people. Another curious feature is the apparently ritual burials of dogs, wolves and ibex. Altogether these graves are most unusual in the Indian context, and seem to belong to a different culture region, with affinities in the Mongolian Neolithic.

In the Neolithic of Karnataka the indications are that stock-raising was the mainstay of the economy, and cattle are found drawn on the rocks around settlements, and as terracotta figurines. Human figures, either depicted on the rocks or in terracotta, are rare, and such examples as are known are male, and often carry a long staff. At some settlements, paintings are found in secluded spots at a discreet distance from the houses, and this led us, at Piklihal, to postulate that such rock shelters must have been cult spots. In one instance the shrine of a mother goddess is still in worship immediately in front of such a cave; and other sites present many comparable indications. We have also suggested that the ash-mounds of this culture, which have been shown to derive from periodical burnings of accumulated cow-dung within cattle-pens, may have been fired

in connexion with seasonal festivals, marking such events as the beginning or end of the annual migrations to the forest grazing grounds. Among modern pastoralists in peninsular India bonfires are still lit at festivals at such times. Cattle are also driven through fires as prophylaxis against disease, just as in the need-fires of western Europe.

The burials of this period in the Deccan were scattered among the houses: adults were laid on their backs in pits, in extended posture, frequently with grave goods. These included stone axes, blades and pottery. In the southern Karnataka pottery headrests are occasionally found in the graves (Figure 37). Infants were buried in many cases in urns, probably beneath the house floors. During the course of the second millennium B.C. a new custom with multiple urns forming a sort of sarcophagus for the collected bones, and other grave goods, makes its appearance. This type of burial is paralleled in Maharashtra (Figure 52).

In spite of the mystery of its undeciphered inscriptions, there is still a considerable body of information concerning the religion of the Indus civilization. As we have seen, a number of buildings both on the citadel and in the lower town at Mohenjo-daro have been tentatively identified as temples. It is from these that a part of the small repertoire of stone sculptures, almost certainly all cult icons, derive. But our information goes far beyond this. Thirty years ago Sir John Marshall, in his brilliant chapter upon the religion of the Indus civilization, was able to propose certain basic elements. He concluded that the great numbers of female terracotta figurines were popular representations of the Great Mother Goddess; and he rightly drew parallels between this evidence and the ubiquitous cult of goddesses both throughout modern India and in literature. He further postulated the presence of a great male God, whom he identified with the later Śiva, and who shared many of his epithets. We are of the opinion that the stone cult icons, and therefore probably also the temples, were dedicated to this same deity. One of the most significant representations is to be found on a series of seals. These show him seated in a Yogic posture, upon a low throne flanked by antelopes, and wearing a great horned head-dress; he is ithyphallic, he has perhaps three faces, and he is

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cations of intrusive elements from the north and west, a significant change is seen in the burial customs, with the appearance of pits lined with stone slabs, in graveyards remote from the settlements. This new practice may be regarded as the herald of the Iron Age burial rites of the peninsula. Meanwhile the evidence at present available suggests that customs in Maharashtra and the peninsula began to differ from those of west and Central India. In the post-Harappan centuries in these latter regions no burials are encountered within the settlements themselves, and no separate burial grounds have so far been encountered. It is always dangerous to argue from the negative and there may be some explanation of this, but the most likely reason is that already in these regions the Aryan rite of cremation was becoming established, and hence that this is the beginning of a profound change which was to dominate growing areas of north India, and to be reversed only after the advent of Muslim burial rites some two millennia later.

With the arrival of iron two broad geographical divisions demand separate consideration. In the north we enter the growing area referable to the Aryan settlements and the Vedic texts, and religion may be said to enter its historic phase. The archaeological evidence is so far negligible, although it may be hoped that more will be forthcoming in the near future. Hencefoward burials are not found, presumably because of the growing fashion of cremation; and at best smaller urns containing cremated ashes are discovered. There is so far no trace of religious structures, nor of icons or cult objects. But during this period, perhaps towards its close, terracotta, bone or ivory representations of mother goddesses, which one writer has understandably compared in form to the Eye goddesses of Mesopotamia, occur at sites in west and north-west India and the Ganges valley. These may be regarded historically as the forerunners of the terracotta art which developed in the final centuries of the first millennium B.C. It is only with the rise of Buddhism in the centuries after the close of our period that religious architecture begins to appear, leading through to the splendid monuments of the turn of the Christian era. The stone cist graves of the north-west, from the valleys of Swat, Chitral and Dir form a notable exception to the rule. It is still not clear how often the

cists contain cremated bones, but certainly in many instances the body was placed in the cist without cremation. The fact that the modern Muslim population here still bury their dead in coffin shaped dry stone cists in graveyards contiguous with the ancient, provides a suggestion that this practice has continued in vogue since its first introduction in antiquity.

For the religion of the southern Iron Age our knowledge is derived almost entirely from graves (Plate 32). We have already described their several varieties and main features in Chapter 8. The many excavations show a baffling assortment of burial practices. In some instances simple inhumation is found; in others the unburnt bones were collected after they had been excarnated and placed in an urn or in a stone cist; in others again only fragments of bone were deposited, and often fragments of many individuals are found in a single grave; cremated bones are encountered in rare cases. It may be remarked that in modern practice burial rites vary from caste to caste, and ethnographic reports from south India can show just as great a variety as the Iron Age graves. Through the whole series runs the idea, present in the earliest Tamil literature and in modern practice, of a dual ceremony. The initial funeral leading to the exposure, burial or cremation of the corpse, is followed by a second ceremony, perhaps taking place only after many months, when the collected bones are deposited in their final resting place. Another detail which links some of the graves with modern practice is the use of lime in the infilling. The orientation of portholes and entrances on the cist graves is frequently towards the south, although in some burial grounds it is towards another quarter, and the grounds themselves are most frequently found to be to the south of the settlements. This demands comparison with later Indian tradition where south is the quarter of Yama. Among the grave goods iron is almost universal, and the occasional iron spears and tridents (*triśūlas*) suggest an association with the god Śiva (Figure 64). The discovery in one grave of a trident with a wrought-iron buffalo fixed to the shaft is likewise suggestive, for the buffalo is also associated with Yama; and the buffalo demon was slain by the goddess Durgā, consort of Śiva, with a trident. A number of remains of structures associated with the graveyards

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expansion of the culture associated with the copper hoards and the Ochre coloured pottery, probably lasting from around 1500 to 1100 B.C.; and a third, also more clearly defined and powerful, culminating in the arrival of the 'Painted Grey ware' and of iron. There can be little doubt that all these waves originated from the direction of Iran, and that all were of Indo-Iranian speaking peoples.

As new discoveries are made it should become increasingly possible to relate our evidence to that of literature and tradition. A prime question must be to identify the cultural remains of the authors of the Rigveda. As we have seen the Rigveda belongs without question to the northern area, and is undoubtedly a compound work accumulated over several centuries. But it is most unlikely that anything in it reflects directly the earliest, or Cemetery H, phase. More probably some of its earliest parts may be associated with the second or third waves. The interesting thesis advanced by Hoernle and Grierson, of an earlier 'outer band' of Indo-Iranian languages, and a later arrival – the language of the 'Midland' – may supply a clue, since the latter language appears to be the direct descendant of that of the Rigveda. Thus the Vedic Aryans should be associated with a later wave, most probably with the third 'Painted Grey ware' thrust into the Punjab. As we shall see below, the earlier waves may then be associated with the ancestors of dialects of the 'outer band' languages to the east, notably with Bengali. We may expect a somewhat similar situation to the south of the Rajasthan desert. There the Banas culture would appear to represent a nucleus of speakers of one of the 'outer band' dialects, who in their turn expanded to the north-east, towards the Doab; the east into Malwa and Central India; and the south-east into the Deccan. But in any case, both in the north and in the south, the distinction between the several waves is not clearly defined, and there must have been considerable overlapping between provinces.

The developments of these centuries in both areas are of profound significance for subsequent Indian civilization, because only by discovering just what traits survived from the indigenous cultures, or were accepted from the new arrivals, can we understand how they both contributed to the subsequent united culture. But one thing cannot be denied, that there is sufficient evidence of survivals from the Harappan civilization at all levels to warrant our regarding it as a major source.

Beyond the natural frontiers of the Indus system one enters regions which have – in most general terms – an internal uniformity of their own. This uniformity coincides with a comparative absence of western, Iranian components in the culture sequence, and also a preponderance of indigenous, Indian traits. In some ways the whole of this great area appears to have been somewhat conservative, and the southern part in particular is characterized by an innate conservatism in material culture. This is already evident in the Late Stone Age, when the southern peninsula shows a remarkable series of evolved Middle Stone Age elements in contrast to the more advanced industries of western and central India. As it appears in 1967 the earliest settled communities in the Indian peninsula cannot be dated to before 2300 B.C., but it seems likely that further research may necessitate considerable revision of this date.

What is striking about the culture of the Neolithic–Chalcolithic sites of the Deccan is their apparently independent ancestry. Although they share many traits with the Baluchi and Indus cultures, they also have features which at present must be seen as purely Indian. There is an extraordinary continuity linking even the earliest settlements with the whole subsequent pattern of life. It is still not possible to decide whether this culture arose without external stimuli. If outside influences played a part, we still do not know whether they came from the west, as affinities with the far earlier Neolithic cultures of the Middle East and the subsequent grey ware cultures of Iran make most plausible; or from the north, as the central Asiatic and even Chinese elements at Burzahom might indicate; or even – though least probably – from the east. Indeed all these may have made their contributions, but the indications are that there was a strongly indigenous flavour from the start. It has been suggested that the Indian humped cattle were first domesticated in the peninsula, and certainly they had already achieved a dominant economic position in the earliest settle-

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REFERENCES

CHAPTER 1

1. *History of Archaeological Research in India*

The fullest account of the subject is in Sourindranath Roy, *The Story of Indian Archaeology (1784–1947)*, New Delhi, 1961. See also S. Roy, 'Indian archaeology from Jones to Marshall (1784–1902)', and A. Ghosh, 'Fifty years of the Archaeological Survey of India', both in *Ancient India*, 9, 1953; J. Cumming, *Revealing India's Past*, London, 1939; F. R. Allchin, 'Ideas of history in Indian archaeological writing', *Historians of India, Pakistan and Ceylon*, ed. C. H. Philips, London, 1961.

CHAPTER 2

1. *General*

The introductory volume of the *Imperial Gazetteer of India*, vol. 1, 1908, contains excellent, if now somewhat out-of-date, discussions of the geography, geology, meteorology, botany, ethnology, languages and population of the subcontinent. For general archaeological bibliography the *Annual Bibliography of Indian Archaeology*, vols. 1–20, published by the Kern Institute, Leiden, is most valuable.

2. *Geographical*

O. H. K. Spate, *India and Pakistan – a regional geography*, 2nd edn, Methuen, 1957, provides a mass of information; L. Dudley Stamp's *Asia, a Regional and Economic Geography*, 11th edn, London, 1962, gives a shorter, less detailed account. For the more narrowly archaeological aspects of geography, see F. J. Richards, 'Geographical factors in Indian archaeology', *Indian Antiquary*, 62, 1933; and B. Subbarao, *The Personality of India*, 2nd edn, Baroda, 1958. See also K. M. Panikkar's *Geographical Factors in Indian History*, Bombay, 1955.

3. *Physical and cultural anthropology*

The late Professor D. N. Majumdar's *Races and Cultures of India*, 4th edn, London, 1961, gives a useful survey of the

physical and cultural anthropology of India, together with an excellent bibliography. B. S. Guha contributed a study of the physical anthropology to the *Census of India, 1931 Report*, vol. 1, part 3, 1953. For ancient skeletal materials, see S. S. Sarkar, *Ancient Races of Baluchistan, Punjab and Sind*, Calcutta, 1964. See also the same author's *Aboriginal Races of India*, Calcutta, 1954. For a recent survey of methods and problems in India, see D. K. Sen, 'Ancient races of India and Pakistan', *Ancient India* 20–21, pp. 178–205. For other references, see under separate chapter headings. For cultural anthropology there are many monographs dealing with specific tribes and communities. For example, see C. G. Seligman, *The Veddas of Ceylon*, Cambridge University Press, 1911; W. H. R. Rivers, *The Todas*, London, 1906; C. von Fürer-Haimendorf, *The Chenchus*, Macmillan, 1943, and *The Raj-Gonds of Adilabad*, Macmillan, 1948; V. Elwin, *The Baiga*, London, 1939, etc. For anthropological studies of Indian village communities, etc., see J. H. Hutton, *Caste in India*, Cambridge University Press, 1946; G. M. Carstairs, *The Twice-Born*, Hogarth Press, 1957; S. C. Dube, *Indian Village*, Routledge, 1955, and many others. A veritable mine of references to all kinds of anthropological and prehistoric writing is to be found in E. von Fürer-Haimendorf's monumental *Anthropological Bibliography of South Asia*, vols 1 and 2, The Hague, 1958, 1964.

CHAPTERS 3 AND 4

1. *General*

The following general accounts of the Indian Stone Age each provide a summary from a different viewpoint, and at a different point in time:

Krishnaswami, V. D., 'Stone Age India', *Ancient India*, 3, 1947.

Subbarao, B., *The Personality of India*, 2nd edn, Baroda, 1958.

Allchin, B., 'The Indian Stone Age Sequence', *Journal of the Royal Anthropological Institute*, vol. 93, part 2, 1963.

Sankalia, H. D., *Prehistory and Protohistory in India and Pakistan* (with further extensive bibliography), Bombay, 1962.

2. *Pleistocene chronology*

A general discussion of problems of Indian Pleistocene chronology and dating will be found together with other papers on prehistory in *Indian Prehistory: 1964*, ed. V. N. Misra and M. S.

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(ed.), *History and culture of the Indian people*, vol. 1, 'The Vedic Age', London, 1951 (with extensive bibliography).

CHAPTER 7

1. *Neolithic groups and cultures*

General. For general discussion of the occurrence and significance of Neolithic tools in India, see E. C. Worman, 'The Neolithic problem in the prehistory of India', *J. Washington Acad. Sci.*, 30, 1949; V. D. Krishnaswami, 'The Neolithic pattern of India', *Ancient India*, 16, Delhi, 1960; B. K. Thapar, 'Neolithic problem in India', *Indian Prehistory: 1964*, Poona, 1965. For east Indian tools and their relations with those of China and Southeast Asia, see A. H. Dani, *Prehistory and Protohistory of Eastern India*, Calcutta, 1960.

NORTHERN NEOLITHIC: The excavations at Burzahom are so far only in summary reports in *IAR*, 1960–61, 1961–2, 1962–3. For the Chinese parallels, see T. K. Cheng, *Archaeology in China*, vol. 1, Cambridge University Press, 1959, and K. C. Chang, *Archaeology of Ancient China*, New Haven, 1963. For the Siberian parallels, see A. P. Okladnikov, 'The Shilka Cave', translated in H. N. Michael's *Archaeology and Geomorphology of Northern Asia*, Toronto, 1964. The Siberian Neolithic cultures provide much interesting comparative material on northern Neolithic economies. The Mongolian evidence is in J. Maringer's, *Contribution to the Prehistory of Mongolia*, Stockholm, 1950.

SOUTHERN GROUP: The principal excavations are:

Brahmagiri: Sir R. E. M. Wheeler, *Ancient India*, 4, 1947.

Sanganakallu: Subbarao, B., *Stone Age Cultures of Bellary*, Poona, 1948.

Piklihal: Allchin, F. R., *Piklihal Excavations*, Hyderabad, 1960.

Maski: Thapar, B. K., *Ancient India*, 13, 1957.

Tekkalakota: Nagaraja Rao, M. S., *Stone Age Hill Dwellers of Tekkalakota*, Poona, 1965.

Utnur: Allchin, F. R., *Neolithic Cattle-Keepers of South India*, Cambridge University Press, 1963.

T. Narsipur: *IAR*, 1959–60, 1961–2.

Hallur: *IAR*, 1964–5.

EASTERN GROUP: The only excavation so far reported is Daojali Hading, *IAR*, 1963–4. See also T. C. Sharma, 'A note on

the neolithic pottery of Assam', *Man* 1967, pp. 126–8. Surface collections have been analysed, with rather unsatisfactory illustrations, by A. H. Dani in his *Pre-history and Protohistory of Eastern India*, Calcutta, 1960, and more recently by Dr T. C. Sharma in his as yet unpublished Ph.D. thesis (London, 1966) on the 'Prehistoric Archaeology of Assam'.

CENTRAL GROUP: Very little is published on this area. See W. Theobald's paper on 'Celts found in Bundelkhand' in *Proceedings of the Asiatic Society of Bengal*, 1862, and H. Rivett-Carnac's 'Stone implements found in the Banda district', *Proceedings of the Asiatic Society of Bengal*, 1882.

EASTERN CENTRAL GROUP: The Kuchai excavation, *IAR*, 1961–2; G. Anderson's paper on 'Notes on prehistoric implements found in Singbhum district', *J. Bihar and Orissa Res. Soc.*, 1917; P. O. Bodding's papers on the Santal collections, in *Journal of the Asiatic Society of Bengal*, 1901, 1904; and F. R. Allchin's paper on 'The Neolithic Industry of the Santal Parganas', *Bulletin of the School of Oriental and African Studies*, 1962.

2. *Expansion of post-Harappan cultures*

Regrettably few of the excavations mentioned in this section have yet been published in full. All those from *Indian Archaeology – A Review*, are short summaries of the season's work. A useful survey of much of this evidence is given by J. P. Joshi, 'Comparative stratigraphy of the protohistoric cultures of the Indo-Pakistan subcontinent', *Eastern Anthropologist*, 15, 1962.

SAURASHTRA: Rangpur: 'Excavation at Rangpur and other explorations in Gujarat', by S. R. Rao, *Ancient India*, 18 and 19, 1963, pp. 5–207.

Somnath (Prabhas Patan): *IAR*, 1955–6, 1956–7.

Rojadi: *IAR*, 1957–8, 1958–9, 1962–3.

Lothal: see references in Chapter 6.

RAJPUTANA (BANAS CULTURE): Ahar: *IAR*, 1954–5, 1955–6, 1961–2.

Gilund: *IAR*, 1959–60.

PUNJAB: Rupar and Bara: *IAR*, 1953–4.

MALWA: Navdatoli: H. D. Sankalia, B. Subbarao and S. B. Deo, *Excavations at Maheshwar and Navdatoli, 1952–53*, Poona, 1958, pp. 1–257; *IAR*, 1957–8.

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2. Copper and bronze

No general study of ancient Indian copper and bronze technology has been made since P. Neogi's *Copper in Ancient India*, Calcutta, 1918, and this work is more concerned with literary sources than technology. However, many individual reports, particularly those of Sir John Marshall and others on the Indus valley sites, contain detailed analyses and other data of copper and bronze objects. A recent summary of the data is in C. C. Lamberg-Karlovsky's, 'Archaeology and metallurgical technology in prehistoric Afghanistan, India and Pakistan', *American Anthropologist*, 69, 1967.

3. Gold-working and mining

See L. Munn, 'Observations and notes on the method of ancient gold mining in southern India', *Tr. Min. Geol. Inst. India*, 30, 1936; F. R. Allchin, 'Upon the antiquity and methods of gold mining in ancient India', *J. Econ. Social. Hist. Orient*, 5, 1962 (with further bibliography).

4. Iron

An old but valuable book is P. Neogi's *Iron in Ancient India*, Calcutta, 1914. Since then most writers have limited themselves to literary references to iron. The most comprehensive account of the introduction of iron to India is in N. R. Banerjee's *Iron Age in India*, Delhi, 1965 (with extensive bibliography). See also L. Gopal, 'Antiquity of iron in India', *Uttar Bharati*, ix, 3, 1962; S. D. Singh, 'Iron in Ancient India', *J. Econ. Social Hist. Orient* 5, 1962. For modern primitive techniques, see V. Elwin, *The Agaria*, London, 1942; and W. Ruben, *Eisenschmiede und Dämonen in Indien*, Leiden, 1939.

5. Pottery

No general study of Indian pottery technology has so far appeared; the nearest approach is in Hindi, by Dr Govind Chand, *Ancient Indian Earthenware Vessels*, Benaras, 1960. Many excavation reports contain studies of technical aspects. Among special papers see E. Mackay, 'Painted pottery in modern Sind', *Journal of the Royal Anthropological Institute*, 60, 1930; F. R. Allchin, 'Poor men's thalis, a Deccan potter's technique', *Bulletin of the School of Oriental and African Studies*, 22, 1959.

6. Other crafts

P. Ray's *History of Chemistry in Ancient and Medieval India*, Calcutta, 1955, contains much interesting information on many aspects of Indian technology. For bead-making, see E. Mackay, 'Bead-making in ancient Sind', *Journal of the American Oriental Society*, 57, 1937, and M. G. Dikshit, *Etched Carnelian Beads in India*, Poona, 1949. For the early occurrence of glass see M. G. Dikshit's exhaustive *Glass in India*, Bombay, 1967.

CHAPTER 12

1. Cave art

Of the earlier literature the most comprehensive survey was by M. Ghosh, 'Rock paintings and other antiquities of prehistoric and later times', *Memoirs of the Archaeological Survey of India*, 24, 1932. A survey of the whole subject is in Gordon's *Prehistoric Background of Indian Culture*, Bombay, 1958, ch. 6. See also Gordon's papers on 'Indian rock paintings' in *Science and Culture*, 5, Calcutta, 1939. For examples of the South Indian bruisings and paintings, see Allchin, *Piklihal Excavations*, Hyderabad, 1961. In recent years V. S. Wakankar has contributed several useful articles, particularly 'Painted rock shelters of India', *Rivista di scienze preistoriche*, Florence, 1962. For Morhana Pahar chariots, see B. Allchin, 'Morhana Pahar, a rediscovery', *Man*, 58, 1958.

2. Painted pottery and terracottas

Most of the extensive literature on terracottas deals mainly with those of the early historic period, and is therefore not relevant to this book. Other references are to be found in works already quoted.

3. Art of the Indus civilisation

The best statement on the various aspects of Harappan art is still to be found in Marshall's *Mohenjo-daro and the Indus Civilization*, particularly chs. 4, 18 and 19. Shorter statements are in works of Wheeler, Piggott, etc., quoted in earlier chapters.

4. Religion

There are few specifically archaeological studies of early Indian religion. On the religion of the Indus civilization, see Marshall's *Mohenjo-daro and the Indus Civilization*, ch. 5. The late Professor D. D. Kosambi has much to say which has bearing on ancient religion, see particularly his *Myth and Reality*, Bombay, 1962, and 'At the crossroads', *Journal of the Royal Asiatic Society*, 1960.

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